The Adoption and Use of ICT in Micro Firms

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Abstract

This thesis examined the usage of E-Business technologies in the SME sector in a regional context, with particular reference to the "Sole-Proprietor" micro-sized grouping. The ongoing interest within the academic community and policy makers could be attributed to the belief that such enterprises would grow and become cornerstones of economic prosperity and wealth creation. The SME community however, particularly the micro-sized classified enterprises have remained characterised by high closure rates. The emergence of E-Business and E-Commerce activity through the popularisation of the Internet and increased availability of affordable information technology was seen as a potential enabling mechanism to improve business productivity and economic prosperity.

To enable this transformation, the use of E-Business was mooted by policy makers, trade groups, enterprise support agencies and academia as a panacea through which enterprises could become increasingly efficient, effective and potentially revolutionalise the business model. An initial investigation of the extant literature revealed that E-Business utilisation levels in Wales SME community was poor in comparison to other UK regions, with low levels of basic technologies and minimal uptake of sophisticated technologies.

The study encompassed a two-stage methodology involving both quantitative and qualitative methods. A quantitative survey was conducted throughout Wales and 500 respondents recorded. In addition, ten in-depth longitudinal case studies of "Sole-Proprietor" micro-sized SME classified enterprises was undertaken over an eighteen-month period.

The survey and case study findings revealed a lack of uptake of sophisticated E-Business technologies within the SME sector. This was particularly prevalent within the "Sole-Proprietor" SME micro-sized

classification, the Owner/Managers therein were revealed to lack understanding and knowledge of the E-Business function. Indeed, the attitudes and perceptions of the Owner/Manager regarding E-Business were found to be of critical importance in the utilisation of technology within individual SMEs. However, there was a lack of Owner/Manager evaluation and strategic implementation of E-Business, resulting in stories of unfulfilled exploitation with minimal impact on the enterprise and resultant disenchantment.

The study proposed a framework to represent the reality of E-Business usage within the SME "Sole-Proprietor" sector. The framework identified the central importance of the Owner/Manager of the "Sole-Proprietor" micro-sized SME in the adoption and utilisation of E-Business and the influence and impact of both external and internal determinants.

The thesis contributed to the literature by identifying that "Sole-Proprietor" SME Owner/Managers were motivated predominantly by maintaining operational sustainability, as opposed to actively pursuing growth through increased technology deployment. The study drew significant comparisons with the TAM, in the specific context of the micro-sized SME sector, in that the usage and further adoption of sophisticated levels of E-Business would only readily occur if the technology become widely available, was usable and affordable and its usage resulted in immediately attainable benefits to the enterprise.

The study concluded that it was essential that government policy makers, academia, trade groups and the private sector involved with encouraging E-Business usage recognised the need for cooperation and coordinated long term strategic planning to ensure E-Business usage within Wales becomes the norm rather than the exception.

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Certificate of Research

This is to certify that, except where specific reference is made, the work described in this thesis is the result of the candidate. Neither this thesis, nor any part of it, has been presented, or is currently submitted, in candidature for any degree at any other University.

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List of Acronyms

Acronym	Description
ADSL	Asymmetric Digital Subscriber Line
ASP	Application Service Provider
B2B	Business to Business
B2C	Business to Consumer
BERR	Department for Business Enterprise and Regulatory Reform
BG	Blaenau Gwent
C2A	Consumer to Administration
C2C	Consumer to Consumer
CCC	Cardiff Chamber of Commerce
CEO	Chief Executive Officer
CRM	Customer Relationship Marketing
DSL	Digital Subscriber Line
DTI	Department of Trade and Industry
DTP	Desk Top Publishing
EAP	Entrepreneurial Action Plan
E-Business	Electronic Business
EC	European Commission
eCIC	Ecommerce Innovation Centre
E-Commerce	Electronic Commerce
E-mail	Electronic Mail
E-procurement	Electronic Procurement
EDI	Electronic Data Interchange
EU	European Union
FE	Further Education
FSB	Federation of Small Business
GEM	Global Entrepreneurship Monitor
GDP	Gross Domestic Product
HE	Higher Education
IA	Industry Activity
IAP	Innovation Action Plan
ICT	Information Communication Technology
IS	Information System
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
LAN	Local Area Network
LE	Large Enterprises
MT	Merthyr Tydfil
NEDS	National Economics Development Strategy
NI	Northern Ireland
NPT	Neath Port Talbot
OECD	Organisation for Economic Co-operation and Development
PC	Personal Computer
PP	Percentage by Perspective
PRS	Private Sector
PT	Port Talbot
PUS	Public Sector
RCT	Rhondda Cynon Taff
RoW	Rest of the World
SBS	Small Business Service
SME	Small and Medium Sized Enterprise
SoGM/s	Stages of Growth Models
TAM	Technology Acceptance Model
TM	Total Model
UA	Unitary Authorities
USA	United States of America
UK	United Kingdom
VAT	Value Added Tax
VG	Vale of Glamorgan
WAN	Wide Area Network
WAG	Welsh Assembly Government
WDA	Welsh Development Agency
WERU	Welsh Economy Research Unit

Chapter 1:

Examining the Usage of E-Business within SMEs

Chapter 1: Introduction - Examining the Usage of E-Business within SMEs

This introductory chapter provides an overview of the research thesis and a generalised introduction to the subject of E-Business usage in the context of the small and medium-sized enterprise (SME). This thesis examined the usage of E-Business by Owner/Managers within SMEs in Wales, with specific reference to micro-sized sole-proprietor classifications.

A significant body of literature espoused the importance of the SME community in engendering economic prosperity and enhanced economic development (Morrison et al, 2003; Levy et al, 2005). Unfortunately, the SME community remains characterised by excessive business failure rates (Dutta and Evrard, 1999), although emergent evidence has suggested some improvement in this trend (DTI, 2007). The adoption of information technology (IT) has offered the opportunity to attain increased business competitiveness and enhanced profitability (Aragón-Sánchez and Sánchez-Martin, 2005). Thereafter E-Business usage has grown in importance and prominence since the emergence and widespread usage of the Internet, alongside the increased adoption of the personal computer (PC) within the business community. E-Business has been defined as the process of doing business electronically, where the Internet, and its related technologies, represented the enabler of more effective and efficient business processes (Darch and Lucas, 2002). The importance of E-Business for the SME community cannot be underestimated, with several authors including Waters (2000), Damanpour (2001) and Burke (2005), suggesting it was no longer an alternative, but an imperative for future business success (Daniel and Grimshaw, 2002). Indeed, Waters (2000) described E-Business as essential to business operations as the telephone.

E-Business represented an enabling mechanism for the SME community, potentially improving the efficiency of business processes, enhancing

communication and revolutionalising existing business models (Chong, 2004; Ottens, 2004). A significant body of literature, however, recognised that the SME community, particularly the micro-sized classifications, were incapable, unable or unwilling to exploit E-Business to its maximum potential, with limited examples of successful adoption and implementation (Brown and Lockett, 2001; Van Beveren and Thomson, 2002; Schlenker and Crocker, 2003).

E-Business utilisation and adoption in SMEs has remained an under researched topic, especially with regard to Owner/Manager attitudes within the micro-sized sized classifications (Jones and Mohon, 2005; Bhararti and Chaudhury, 2006; Fink and Disterer, 2006). Several researchers have identified that the knowledge of the determinants of E-Business usage and adoption are limited (Houghton and Winklhofer, 2002; Downie, 2003; Martin and Matlay, 2003; Pflughoeft et al, 2003). The ongoing debate within the literature concerned the nature of SME E-Business adoption and utilisation. Alonso Mendo and Fitzgerald (2005a) suggested the adoption process pursued a series of sequential stages, whilst latterly; a counter argument emerged, positing a dynamic zigzag development process. The relevance of such IT development frameworks for SMEs, including the Technology Acceptance Model (TAM) (Davis, 1989) was considered within the thesis.

The central proposition of this thesis was to explore SME Owner/Manager attitudes towards E-Business adoption within the context of "Sole-Proprietor" micro-sized SMEs. Most specifically, to examine whether SME Owner/Manager utilised E-Business technologies to achieve business growth.

To evaluate this proposition, three central aims were identified: -

1. Identify and evaluate key factors associated with effective E-Business adoption and usage within SMEs in Wales.

   This aim was driven by the need to understand the key concepts influencing E-Business usage and adoption in the context of the SME sector within Wales. A number of surveys previously undertaken by academia and trade associations to measure levels of E-Business utilisation within the context of the UK and Wales (NOP, 2000; DTI, 2004; eCIC, 2005; FSB, 2006) revealed low, although increasing, levels of usage. Whilst these studies were useful in illustrating the trends of E-Business utilisation, they did not provide in-depth understanding of the inter-relationship of these concepts. Several authors including, Jones and Mohon (2005) and Fink and Disterer (2006), highlighted the need for further research to clarify such issues.

2. Critically evaluate and contrast the usage of E-Business within micro-sized "Sole-Proprietor" SMEs against other SME size classifications to identify key variances in behaviour and usage practices.

   Further evidence was required to differentiate the usage of E-Business technologies across different SME size classifications in order to understand the key issues influencing adoption within each grouping. Evidence regarding the adoption and usage of E-Business technologies within the SME sector was limited to public sector surveys as reported above, providing snapshot studies of utilisation (Brown and Lockett, 2004). Whilst informative, such studies provided no in-depth understanding of the adoption and usage issues faced by SME Owner/Managers at each SME size classification.

3. Develop a model illustrating the key actors and micro and macro relationships within the E-Business environment for the micro-sized "Sole-Proprietor" SME classified enterprises from the perspective of the Owner/Manager.

There was limited understanding regarding the role and behaviour of Owner/Managers of the "Sole-Proprietor" micro-sized SMEs community in relation to E-Business usage. The key factors underpinning usage and adoption in relation to micro and macro relationships required clarification to conceptually model the reality and inform practice. The next section outlined the research process undertaken within this thesis.

1.1 The Research Process

The evidence required to fulfil the research objectives was drawn from a range of primary and secondary sources as illustrated within Figure One. This figure provided a knowledge map and highlighted the contribution made by each information source towards the areas of enquiry within the thesis. A range of secondary sources was collated and analysed, including E-Business surveys undertaken within Wales, academic and professional journal and academic and professional books. The relevance of existing IT adoption and diffusion frameworks was considered including the TAM, E-Business and entrepreneurial growth frameworks. The frameworks were appraised and found to lack relevance to the context of the SME sector, especially the micro-sized "Sole-Proprietor" classifications. Moreover, the secondary evidence suggested a limited extant knowledge of the SME Owner/Manager attitudes towards E-Business adoption and usage. A multiple methodology was developed, as explained within Chapter Four, to examine the phenomena.

A significant quantitative survey was undertaken of SMEs within Wales to examine the accuracy of prior studies and enable a contrast between the different SME size classifications. The study outlined in Chapter

Five, revealed limited utilisation of E-Business technologies especially within the context of the "Sole-Proprietor" SME micro-sized classification. This sector was defined by the Department of Trade and Industry (DTI), (now known as Department for Business Enterprise and Regulatory Reform BERR), as an SME without employees and represented over 70% of the entire population (Small Business Service (SBS), 2005a). The review of the extant literature revealed that there was no consideration of this statistically significant sector and further research was required to explore the reality of E-Business usage within this SME sector.

As a result, ten case studies of existing "Sole-Proprietor" sized SMEs were compiled within Chapter Six, to investigate the reality of E-Business from the context of the Owner/Manager to uncover the key reasons underpinning usage of E-Business.

1.2 Synopsis of Thesis Structure

This section identified the content of the seven chapters within this thesis. Evidence for the thesis was drawn from several complementary academic literatures, including entrepreneurial, IT, computing and E-Business, which examined the underpinning reality of technology usage. The applicability and relevance of various models and frameworks to represent E-Business usage and deployment was considered including the TAM. Chapters Two and Three investigated the current E-Business literature; Chapter Four discussed the survey methodology, Chapters Five and Six provided the primary research and Chapter Seven drew conclusions against the primary research and extant literature. Specific descriptions of the chapters' contents were outlined hereafter.

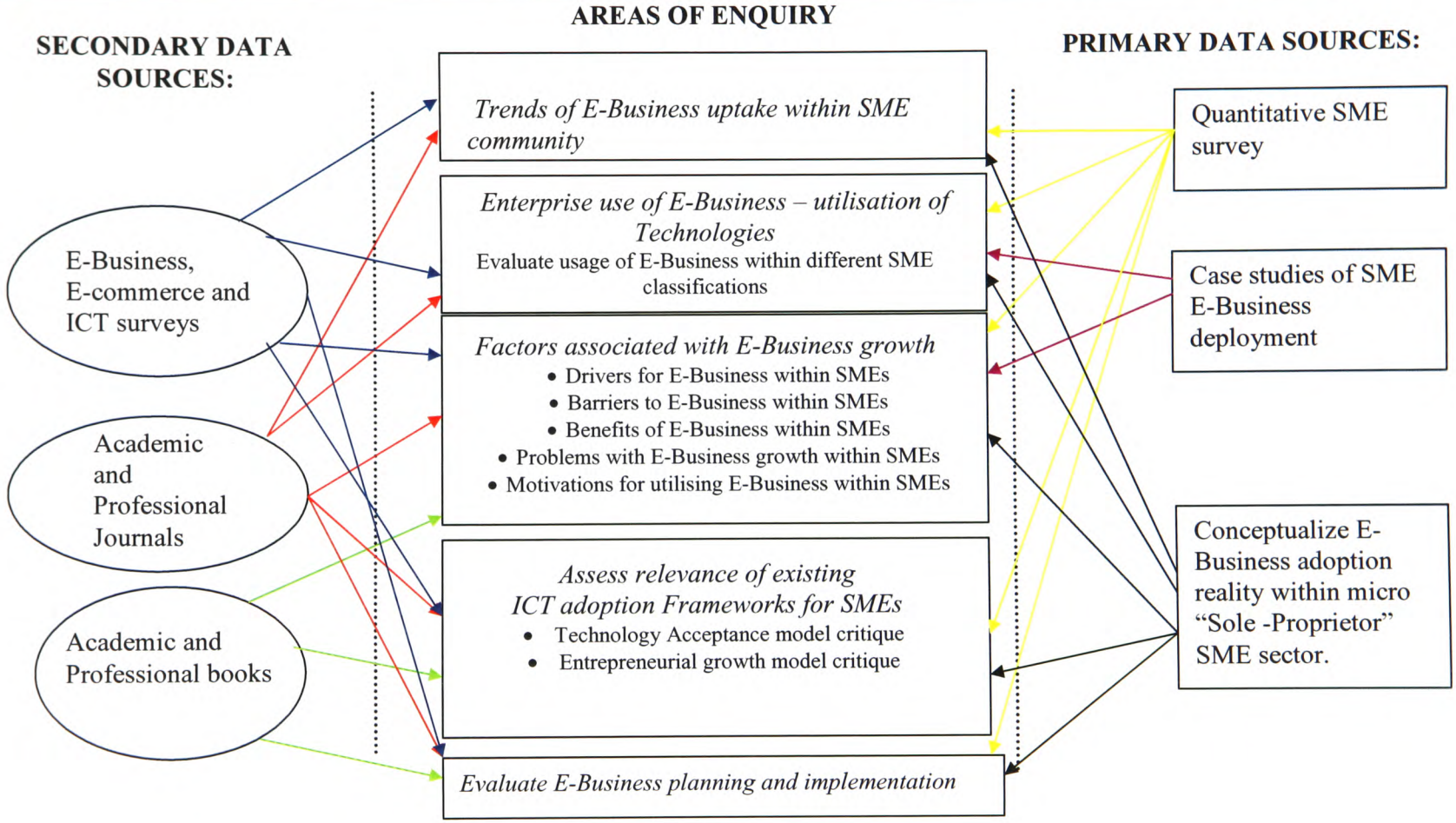
Chapter Two provided working definitions of the key concepts under investigation within this thesis, namely IT, information systems (IS), E-Business, E-Commerce, the SME, and the role of the Owner/Manager. In addition, the domain of the study was provided with a profile of the

Welsh economy, literature from an entrepreneurial and IT/IS perspective, the nature of business modelling and the development of the Internet.

Chapter Three provided a critical review of the salient E-Business literature, commencing with a review of IT/IS in the context of the SME sector, focusing on the benefits, drivers and inhibitors underpinning effective deployment and usage. The influence and relevance of Roger's (1983) diffusion innovation model and the TAM were appraised. The necessity for strategic alignment of the IT/IS function was also considered. The development of E-Business was charted through a critical appraisal of the emergence of the Internet and the latest literature including a review of website performance and effectiveness.

Thereafter, this chapter provided a detailed review of existing levels of E-Business usage within the UK and Wales, utilising recent academic and public sector surveys. The chapter concluded by formulating the key research questions developed from the preceding literature. The research questions provided increased focus for the research aims, namely to identify the key inhibitors and drivers to E-Business usage, Owner/Manager perceptions and extent of planning of the function within the SME.

Figure 1: Knowledge Map: areas of enquiry and sources of information



Chapter Four described the methodology employed within the thesis. To enable the study to examine the phenomena of E-Business usage, a longitudinal mixed method methodology was developed. The study was located in Wales to provide specific focus to examine the salient factors underpinning usage of E-Business within a particular geographical region. Existing research was restricted to a limited number of quantitative surveys within a regional, national and international context providing snapshots of E-Business uptake. These surveys were of value in identifying key variables influencing E-Business utilisation, although they did not provide an insight into the usage within an individual enterprise. Moreover, existing surveys within Wales were under representative of the micro-sized SME classifications. Therefore, a significant representative survey and thereafter a series of case studies with individual micro-sized "Sole-Proprietor" SMEs were undertaken. The chosen methodology enabled the study to uncover generic usage levels and salient factors influencing adoption plus the nature of development of E-Business within a range of individual enterprises. E-Business uptake within the "Sole-Proprietor" SME size classification was contrasted against trends within the other size classifications to identify the key factors underpinning usage. The first stage, a quantitative survey of 500 respondents, was undertaken utilising a representative cross section of SMEs by SME size classification, industry activity (IA) and local authority (LA). Thereafter, ten in-depth case studies were undertaken which explored the nature of E-Business usage within "Sole-Proprietor" micro-sized SMEs.

Chapter Five provided the results of the quantitative survey. The performance in traditional trading markets was appraised and levels of IT/IS established. The usage levels of IT/IS performance was contrasted by IA sector, LA and SME size classification. Levels of E-Business usage were identified in terms of Internet access, E-mail and website usage. Performance of enterprise websites was appraised on a cost against benefit analysis. Thereafter, the drivers and benefits, inhibitors and perceptions of E-Business usage were evaluated. The chapter

identified the current problems associated with E-Business and evaluated the levels of management and planning undertaken. Key conclusions were drawn on E-Business performance within the survey respondents.

Chapter Six analysed the results of the case studies providing in-depth profiles of participants and a review of usage and impact of E-Business. The views of the Owner/Managers of the individual SMEs were appraised in-depth to consider the perceptions, drivers and inhibitors to usage and the level of effective strategic management and planning. In addition, the SMEs website performance was evaluated in terms of usability, information provision and service interaction. The chapter ended by drawing conclusions on the case studies key findings.

Chapter Seven offered a critical appraisal of the empirical evidence and provided meaningful conclusions on the relationship between the different literatures discussed in Chapters One, Two, and Three and the findings from the survey and case studies presented in Chapters Five and Six. This chapter identified the key reasons underpinning E-Business usage, the effectiveness of this process and the proposal of a framework to conceptualise this behaviour. Thereafter, conclusions were drawn as to the challenges of research in this field, as well as a general critique and reflection on the part of the researcher. This chapter identified how the research aims had been achieved, the key implications for E-Business stakeholders and assessed the contribution to knowledge, the limitations of the study and the future opportunities that this research provided. Beyond this chapter, the appendices contained further resource material, including copies of the research instruments deployed, statistical output and the referenced and bibliographic sources underpinning this thesis.

Chapter 2:

The Research Domain

Chapter 2: Introduction to the Research Domain

This chapter contextualised and defined the key concepts under examination within this thesis. To enable this thesis to be framed, the key concepts under investigation were defined, namely IT, IS, the SME, Owner/Manager and E-Business/E-Commerce. A discussion of the development of the Internet and a profile of the Welsh economy were included to provide a context to the thesis. The nature, evolution and emergence of growth models were critiqued from both entrepreneurial and IT/IS perspectives. The terms E-Commerce and E-Business, introduced in the previous chapter were evaluated in terms of nature and scope of emergent technologies and the opportunity they provided within the SME community as an enabler of economic activity. The literature examining the utilisation of E-Business technologies within the SME sector was explored further within Chapter Three.

2.1 Information Technology and Information Systems

This section defined two of the key concepts utilised within this study namely IT and IS. The terms IT and IS were standard descriptions for the use of computing within the enterprise and their usage was commonplace within academic literature (Raymond and Magnenat-Thalmann, 1982; Cragg and King, 1993). This thesis employed a widely recognised definition from the Oxford English dictionary (2004: 288) to describe the concept of IT as: -

> *"The study or use of computers and telecommunications for storing and sending information."*

SMEs that utilised IT through the use of IS's, were defined as: -

> *"The study of information production, flows and use within organisations."*
>
> (Clarke, 1992: 2)

Thus, IT was regarded as the tangible mechanism, and IS the process through which E-Business could be undertaken within the enterprise. To ensure readability and consistency, the term IT/IS was utilised to refer to this concept throughout the thesis. The concept E-Business was defined in Section 2.7 of this chapter.

2.2 Small and Medium-Sized Enterprises

This section defined one of the key concepts of this study, namely the SME. The importance of the SME sector was initially recognised in the Bolton Report (1971), which stated that a small enterprise was an independent business, managed by its owner or part-owners possessing a small market share (SBS, 2005b). Storey (1994), Pollard and Hayne (1998), Anderson et al, (2001), Tonge (2001) and Fink and Disterer (2006), however, argued that there were no universally accepted definition for an SME, and much disparity existed between nations, although they were typically based on number of employees. Rigorous research required that the concept was defined to remove ambiguity within a study due to reported variations in definitions (Bridge and Peel, 1999; Lohrke et al, 2006). The European Commission (EC) set out a single widely utilised definition of SMEs (EC, 1996; Downie, 2003; Simmons et al, 2007), as enterprises employing fewer than 250 employees, with an annual turnover of less than 40 million Euros, or an annual balance sheet of no more than 27 million Euros. This was subsequently revised in 2003 to increase financial ceilings (Table One), due to inflation and productivity increases since 1996 (EC, 2003).

Table 1: European Community Definitions of SMEs

Criterion	Micro	Small	Medium
Maximum number of employees	<10	<50	<249
Maximum annual turnover in Euros	2 million	10 million	43 million
Maximum annual balance sheet total in Euros	2 million	10 million	27 million

(Source: EC, 2003)

This definition has been criticised as being, all embracing with not enough differentiation between enterprise types (Dalitso and Peter, 2000). Alternatively, it was praised as being consistent in providing a definition based exclusively upon employment, which was applicable across industrial sectors (Tonge, 2001). Whilst there was a need to provide a clear definition of the concepts under investigation, it was also necessary to appreciate the current trends influencing each concept. The Department of Trade and Industry (DTI) within the United Kingdom (UK), defined SMEs into the following categories (Table Two).

Table 2: Definitions of the SME as employed by National Statistics Office

Size Categorisations of SMEs by Employee Number							
Sole-Proprietor No Employees	1-4	5-9	10-19	20-49	50-99	100-199	200-249

(Source: SBS, 2005a)

This study employed a hybrid definition of the European Commission (EC) classification (Table Three). The rationale behind this decision was to enable categorisation of SMEs into the three recognised sized groups namely micro (0-9), small (10-49) and medium (50-249) and the widespread use of the EC definition deployed within prior studies (Gray, 2004a). There was a need however, to further categorise the micro-sized SME group to denote the "Sole-Proprietor" or "Size class zero" enterprises, as they represented over 70% of all SMEs within Wales and the UK (SBS, 2005a). Hay and Kamshad (1994) noted that such enterprises often remained constant in size as their existence provided lifestyle advantages for Owner/Managers. Such enterprises typically had minimal ambition beyond maintaining their current operations and providing their products and services within existing markets (Levy et al, 2005).

Table 3: SME Groupings by Number of Employees		
SME Size Classification	Grouping	Number of Employees
Sole-Proprietor	Micro	None
1-9	Micro	Between 1-9
10-49	Small	Between 10-49
50-249	Medium	Between 50-249

SMEs have played a significant role in national and international economies (Baldwin et al, 2000), providing up to 80% of economic growth (Jutla et al, 2002; Morrison et al, 2003), but also contributing towards social cohesion (Street and Meister, 2004), engendering competition (Morris and Brennan, 2000), employment and regional development (Fielden et al, 2000; Jutla et al, 2002; OECD, 2004); in addition to being a valuable source of business innovation (Fielden et al, 2000). The main identifying feature of SMEs was they were "not large" (Gilmore et al, 2001) as they did not comprise the core of the largest 10% or 20% of enterprises by employment in the market or industry and possessed unique individual characteristics (Barnett and Mackness, 1983; Hall et al, 1997).

The SME sector remains characterised by an absence of standardisation and working relationships, a flat organisational structure (Storey and Cressey, 1995), limited staff development and inherent flexibility (Subba Rao et al, 2003). Wynarczyk et al, (1993) suggested that SMEs were influenced by uncertainty, innovation and business evolution and these factors represented the defining characteristics of this sector. In the enterprise literature, current academic debate focussed on the classification of business behaviour by business typology (Wong and Merrilees, 2005), behaviour, growth, sustainability (Hillary, 2000) and networking (Miner, 2000; Johannisson et al, 2002; Moen and Servais, 2002; Bridge et al, 2003); the pertinent elements of which were considered within the context of SME E-Business usage throughout Chapter Three.

Analysis of DTI statistics concerning SME performance provided significant evidence (Table Four) regarding the economic importance of "Sole-Proprietor" micro-sized classified enterprises, to both Wales and the UK (SBS, 2005a). Within the UK economy, SMEs accounted for 99.8% of all UK enterprises and 99.9% of total Welsh enterprises. Moreover, the "Sole-Proprietor" enterprises - those made up of sole traders without employees (Fielden et al, 2000; Gray and Lawless, 2000; SBS, 2005a) - accounted for 70% of all UK enterprises. Such enterprises were typically described as lifestyle businesses, as they had minimal inclination towards achieving growth (Hisrich and Peters, 1998; Jones, 2004). Contrastingly, medium sized (50 to 249 employees) and non-SME classified enterprises (greater than 250 employees) comprised only 0.7% and 0.2% of total UK enterprises, respectively. Therefore, in a representative quantitative surveys of the SME sized sector, the expectation would be that the micro-sized enterprises would have dominated the sample (Fillis and Wagner, 2005). In addition, Table Four revealed that SMEs in the UK generated 48% of employment and 75% within Wales. Such statistics emphasised the reliance of the Welsh economy on the SME community.

It was apparent that the performance of the "Sole-Proprietor" SME classified sector was inferior in comparison with other SME sectors, contributing only 11.3% of the employment and 7.4% of turnover in the UK (Table Four), suggesting that such enterprises were not maximising their potential. WERU (2005) and the National Statistics (2005) database identified that the majority of the remaining Welsh working population 23% was employed within the public sector. Morrison et al, (2003) noted that the SME sector has made a large net contribution to new job creation and, as Table Four illustrated, SMEs in the UK accounted for 50% of turnover compared to 65% within Wales. Welsh SMEs accounted for a greater proportion of total enterprises than in any other UK region, with the exception of Northern Ireland (NI) (99.9%), which had a similar proportion.

Table 4: SME Statistics by Number, Employment and Turnover for the UK and Wales

Total Number of Enterprises	All	Sole-Proprietor	%	1-49	%	50-249	%	All SMEs	%	Non SME (250+)	%
SME classification by Number of Enterprises											
UK	4,097,095	2,870,180	70.1	1,189,915	29.0	28,750	0.7	4,088,840	99.8	8,255	0.2
Wales	172,335	122,680	71.2	48,425	28.1	1055	0.6	143,991	99.9	175	0.1
SME by Employment											
UK	27,958,935	3,159,000	11.3	7,225,000	25.8	2,928,000	10.5	13,312,000	47.6	14,647,000	52.4
Wales	703,000	142,000	20.2	285,000	40.5	102,000	14.5	529,000	75.2	174,000	24.8
SME by Turnover (£ million)											
UK	2,400,741	177,506	7.4	699,808	29.1	327,176	13.6	1,204,490	50.2	1,196,251	49.8
Wales	55,659	5,611	10.1	20,938	37.6	9,649	17.3	36,198	65.0	19,461	35.0

(Source: SBS, 2005a)

In summary, the UK economy and Wales in particular, has remained dependent on the success of the SME sector as a significant provider of employment and turnover, and crucial to its ongoing economic prosperity. Therefore, it followed that any valid studies of the E-Business phenomenon, within the context of the UK, would encompass and reflect the trends and uptake in the "Sole-Proprietor" SME size classification. The current understanding of E-Business deployment within the various SME size classifications remains limited and represented the key focus of this thesis as outlined within Section 1.0.

2.3 SMEs Contribution to Economic Activity

Ghobadian and Gallears (1996), OECD (2000a) and OECD (2004) identified that governments worldwide recognised the importance of SMEs at both micro and macro levels and their contribution to economic growth, social cohesion, employment, regional and local development (Levy et al, 2005). Chapman et al, (2000) suggested that SMEs, after the United States of America (USA) and Japan, should be considered as the third economy in the world and the lifeblood of modern economies (Ghobadian and Gallears, 1996). Globalisation and technological change created potential opportunities for SMEs to enter foreign markets and reduce operating costs, although significant transition costs exist, in addition to new competitive challenges (OECD, 2000b). Curran and Blackburn (2001) recognised the importance of the SME community to the UK's economic future, especially within the knowledge-based sectors. Given the ongoing decline of the primary and manufacturing sectors within Wales, there was a need to encourage innovation within the SME community (WAG, 2003; WAG, 2005; Brooksbank, 2006). It remained important, therefore that the UK government encouraged the development of innovation, entrepreneurship and business start-up in the SME sector.

The Global Entrepreneurship Monitor (GEM) (2006) found that Wales had an entrepreneurial activity rate of 5.5%, an increase of 2.9% since

2000 (Figure Two). In 2006, Wales was ranked 28th out of 43 nations surveyed, suggesting a necessity to encourage the population to undertake small business start-up activities. However, whilst the rate of entrepreneurship in Wales was generally inferior to that of the rest of the UK from 2000-2006, the evidence suggested that the performance gap was narrowing (GEM, 2006). When the UK's total entrepreneurial activity (TEA) rate was contrasted against other nations involved within the latest GEM 2006 report (Bosma and Harding, 2006) the results were disappointing. The UK was ranked 27th out of 42 nations surveyed in the percentage of the population involved in early stage entrepreneurial activity. Similarly, the UK attained the same ranking in established business ownership (Bosma and Harding, 2006), suggesting significant room for improvement was possible in the embedding of an entrepreneurial culture and mindset.

Troye-Walker (1998) identified SMEs as a critical success factor for ongoing growth of E-Business within Europe. This was reinforced by the eEurope Go Digital initiative (2002) which constituted a European Union (EU) policy response for assisting SMEs adopt E-Business. This consisted of policies to raise the awareness, establish support networks and enable participation of E-Business amongst SMEs. Within the UK, the new Labour government established "UK online" as an umbrella brand to encompass all Government activity in support of E-Business, the population and local government to ensure the most effective use of E-Business technologies (Cabinet Office, 1999). This was enabled by creating a network of a wide range of businesses and support organisations, UK online, academic experts, Small Business Service, Business Links and UK online for business advisers. Thus, Owner/Managers acting as the key decision makers in SMEs should have recognised the potential opportunities that E-Business provided in new markets, and developed appropriate business strategies to ensure successful exploitation was achieved.

The SME sector has been characterised by high business rates failure within Europe (Dutta and Evrard, 1999) with a UK survival rate of 92% and 66% after one and three years respectively (SBS, 2005b), although recent evidence suggested marginal improvement had occurred (DTI, 2007). Wales was ranked tenth out of the twelve UK regions in terms of its registration rate of new enterprises in 2005 (only NI and the north east were deemed inferior) (DTI, 2006). Since 1994, the number of business registrations in comparison to de-registrations in Wales has improved steadily (Figure Three). The number of enterprises undertaking business start up since 1994 (6,315 enterprises) had only marginally improved by 2005 (6,430) (DTI, 2006). Furthermore, these statistics did not include enterprises falling below the VAT threshold of £58,000 (SBS, 2005c), so the reality was undoubtedly bleaker as such enterprises were more prone to closure and their performance remained largely unreported within the literature (Beaver, 2002).

The Welsh Assembly Government (WAG), (2004) identified the prime reasons for business failure within SMEs fewer than three years old as issues of finance, demand forecasting, management, marketing, capitalisation and business planning. Birley (1996) reported the importance of a viable business idea, suitable resources and business acumen to manage a successful enterprise. The use of E-Business offered the potential for the SME community of increased efficiency, effectiveness and the opportunity to participate, promote and trade within new markets (Fink, 1998). This thesis examined E-Business usage and development occurring within the context of existing SME sized enterprises. The next section considered the role of the Owner/Manager within the SME.

2.4 The Owner/Manager

Throughout this study, reference was made to the individual with responsibility for the ownership and management of the SME. Gartner (1989: 48) defined this individual as:-

> "... *a person who creates organisations.*"

whilst Shane and Venkataraman, (2000: 218) described them as: -

> "... *the person who recognises and acts to exploit an opportunity.*"

Hiltrop (2005) asserted that good management fostered organisational success whilst poor managerial practices resulted in business failure. Ineffective managerial competencies have been associated with business failure in several studies (Gaskill et al, 1993; Jennings and Beaver, 1997; Perry, 2001; Walker et al, 2007). Owner/Managers desired their enterprises to succeed and be profitable, however Walker et al, (2007) suggested that many were poorly equipped in terms of business knowledge and skills.

SMEs typically reflected the personality of their creator, employing a direct management style within a shallow hierarchical organisation structure (Ferneley and Bell, 2005). Billet (2001), Bartram (2005) and Walker et al, (2007), acknowledged that SME Owner/Managers had lower formal education levels and training provision in contrast to managers of larger-sized enterprises. Furthermore, this individual determined the ethics, recruitment, working practices, financial resources and operating decisions of the enterprise, overseeing and driving the IT/IS adoption and usage policy within the enterprise (Peppard and Ward, 1999; Fillis et al, 2004).

Figure 2: GEM Total Enterpreneurial Activity in Wales and the UK 2000-2006

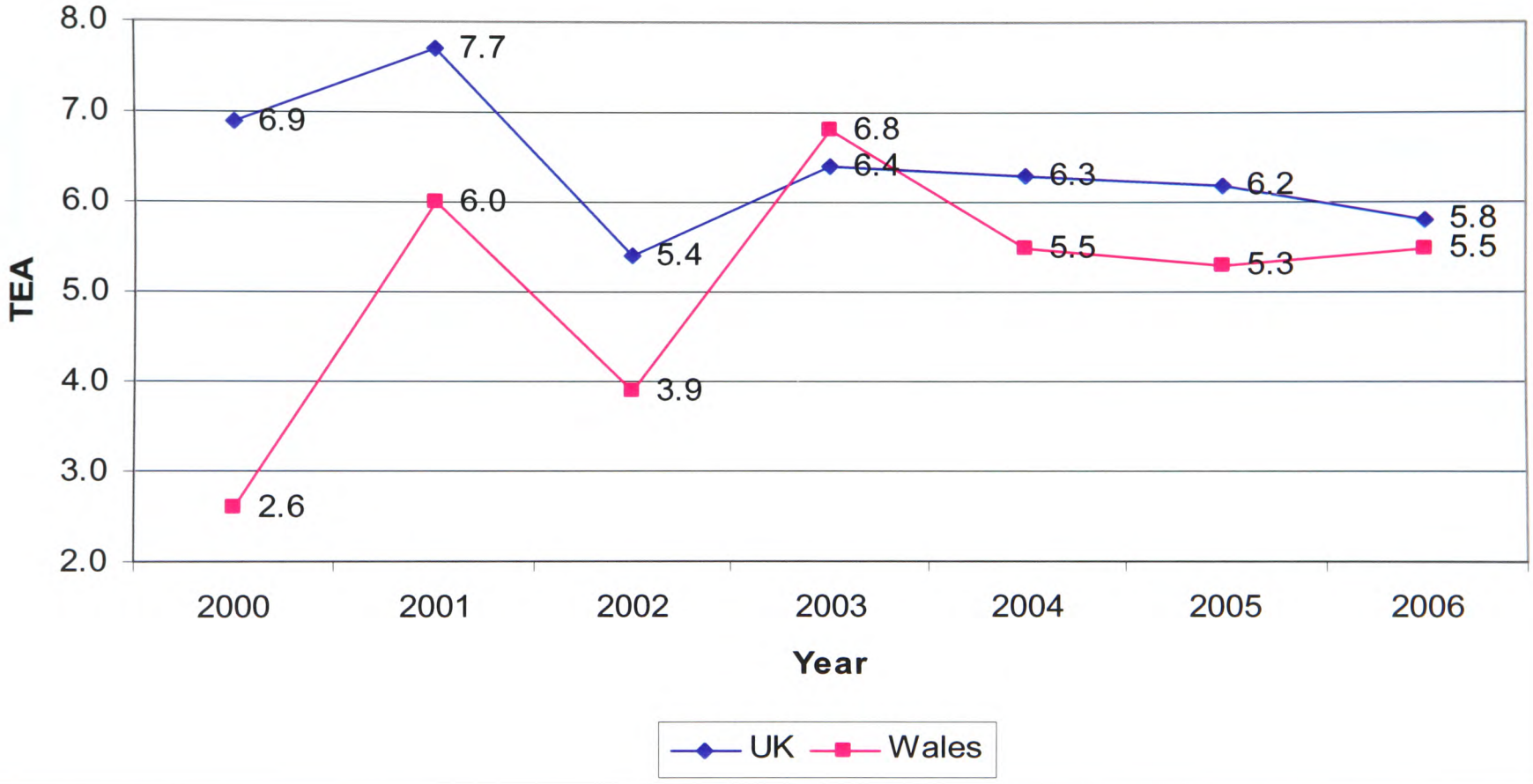
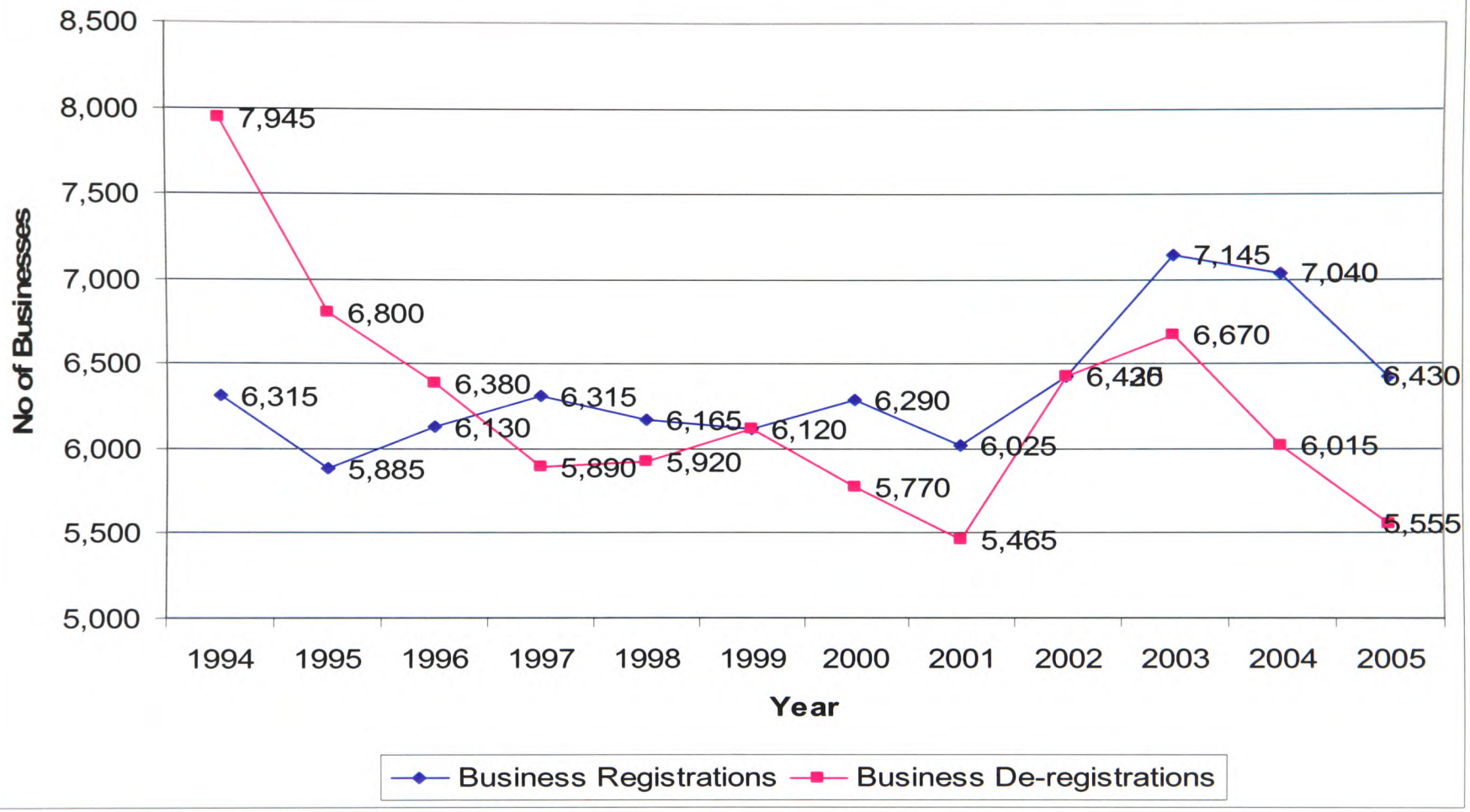


Figure 3: Business Registrations/De-Registrations in Wales 1994-2005

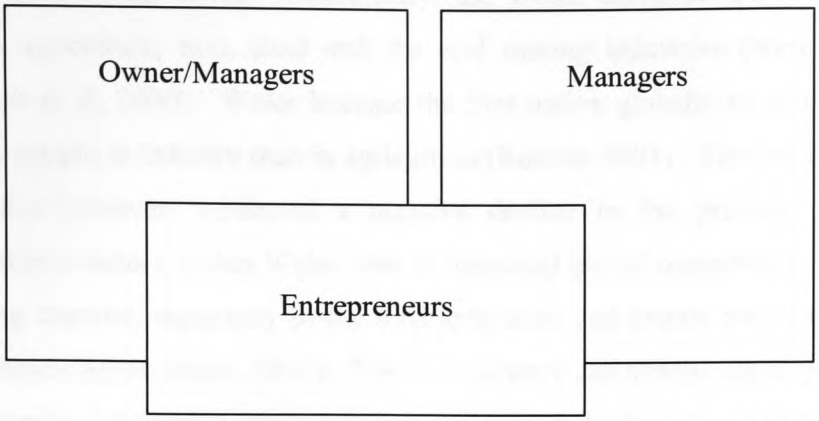


A plurality of labels have been employed describing this role, including Owner/Manager (Watson et al, 1998; Johnston and Loader, 2003; Burns, 2006; Walker et al, 2007), Owner-operators (Watson and Newby, 2005) manager, chief executive officer (CEO) and entrepreneur (Beaver, 2002; Lefebvre et al, 2005). Birley (1996) and Burns (2006) differentiated between the role of entrepreneurs, managers and that of the Owner/Manager. Burns (2006) argued that Owner/Managers typically operated lifestyle businesses, which had a tendency to remain static in size, whilst entrepreneurs actively pursued business growth and displayed more opportunistic and innovative character traits.

Family businesses, as defined by Nelton (1986), Rosenblatt et al, (1985) and Poutziouris (1994), was not considered within the remit of this study. The rationale being that family businesses could have included non-SME categorised enterprises and would not fulfil the requirements of the SME definition identified in Section 2.2; the study would lose focus as a result. Furthermore, it was extremely difficult to identify family businesses, as they were not recognised as a separate entity within the main SME listings such as local authority or telephone directories. Managers of SMEs were described as individuals who did not own or control the enterprise within which they were employed (Burns, 2006) (Figure Four).

To ensure consistency and readability, the term "Owner/Manager" was utilised throughout the thesis to describe the person who owned and/or managed the activities within the SME and included both the entrepreneur and the Owner/Manager. The central importance of the Owner/Manager in controlling the adoption and usage of E-Business within the individual enterprise is explored within this thesis.

Figure 4: Managers, Owner/Managers and Entrepreneurs



(Source: Burns, 2006: 13)

Where an individual managed the business activities of an SME, the term "Manager" was used to describe their role. The significance of the Owner/Managers role in managing E-Business usage and uptake was considered in depth throughout Chapter Seven. The next section considered the locality of the study, namely Wales, and evaluated its economic climate.

2.5 The Welsh Economy

Wales was selected as the area of investigation of this thesis for several reasons. Firstly, the thesis author was employed and resided within Wales, thus maximising access to SMEs within local authorities. Secondly, uptake and usage of E-Business within Wales remained largely unreported outside government-related bodies, as can be evidenced by the paucity of academic E-Business literature. This indicated the need for further research to enhance the extant knowledge. Thirdly, the poor uptake of E-Business within Wales (eCIC, 2005), in comparison to the rest of the UK (DTI, 2004), was significant and warranted further investigation and explanation. Section 3.8 provided an in-depth review of E-Business utilisation in Wales and identified the limitations of existing knowledge.

The second aim of this section considered the economic conditions prevalent in Wales and established the likely influence on E-Business utilisation within SMEs. Historically, the Welsh economy was based upon agriculture, iron, steel and the coal mining industries (Beynon-Davies et al, 2000). Wales became the first nation globally to employ more people in industry than in agriculture (Renton, 2001). The last four decades however, witnessed a massive decline in the primary and secondary sectors within Wales, due to increased global competition and falling demand, especially in the coal extraction and metals production industries (Jones-Evans, 2001). The coal industry can now be considered a minority employer and the metals processing industry concentrated in two integrated steel plants whose future and ownership remain uncertain (WERU, 2005).

The National Economic Development Strategy identified the key contributors to inferior economic performance in Wales as: -

- a weak indigenous business base
- low activity rates
- depleted added value production
- too few enterprises exporting
- under developed service sector
- a lack of high technology, knowledge-driven industries with insufficient research and development
- minimal exploitation of ICT
- low wages
- deprived levels of entrepreneurship
- high business failure rates
- meagre growth rates from SMEs to public limited companies
- under developed potential within the tourism industry (NEDS, 2001).

As a result, the surviving industries were restructured to increase efficiency and competitiveness; a consequence of which was large-scale job losses and increased reliance on the tertiary sector to provide employment although typically low wage, cost and skills. These low weekly earnings have resulted in a migration amongst skilled workers, subsequent skills shortages in certain sectors and a lack of sufficient professional and managerial positions (Beynon-Davies et al, 2000). Consequently, this skills shortage within Wales resulted in some businesses relocating to other UK regions, e.g. Stilo International, a small high technology enterprise, moved to Bristol due to their inability to recruit appropriately skilled staff in the area (Renton, 2001).

The Welsh economy has remained characterised by a large proportion of indigenous SMEs operating within the manufacturing and heavy industries, together with a limited number of large, foreign owned (including US, Korean and Japanese) multi-national assembly plants from the electronics (e.g. Sony, Panasonic etc), chemicals (Dow Corning) and motor vehicle (e.g. Ford, Toyota) sectors (Beynon-Davies et al, 2000; WERU, 2005). During the 1980s and 1990s, Wales was one of the most successful regions within the EU in attracting foreign investment to replace employment lost in the declining primary sector (Jones-Evans, 2001; WERU, 2005). This inward investment strategy resulted in Japanese companies such as Sony and Panasonic receiving an estimated £30m of Welsh regional aid (Renton, 2001). Employment from such enterprises has, however accounted for fewer than eight per cent of the total Welsh workforce and the jobs created have tended to be poorly paid, low skilled with minimal contribution to the local economy (Renton, 2001; Miller et al, 2002).

Whilst this policy could have been viewed as successful in creating employment in largely assembly-related factories, there have been several high profile withdrawals and failures in recent years (e.g. LG and Sony) (Jones-Evans, 2001). Indeed, a report by the Wales Audit Office identified that the failure of the LG project cost the Welsh taxpayer in

excess of £60 million (BBC, 2007). This trend suggested that such organisations provided minimal consideration to regional or national concerns within Wales, only favourable economic pre-conditions, and further withdrawals and job losses were predictable (Bryan, 2005). Despite these claims, inward investment has continued to grow with Wales attracting 67 foreign investment projects during the 2006-2007 financial year compared with 52 in the previous year (Blake, 2007). However, the Welsh economy continued to experience a significant increase in social deprivation within many areas such as Merthyr Tydfil (MT) and Blaenau Gwent (BG) experiencing ongoing long-term high unemployment (WAG, 2005).

Due to economic under-performance, parts of Wales were eligible for up to £1.3 billion of EU regional grants between 2001 and 2008 to assist the revitalisation of the economy (Miller et al, 2002) despite the existence of areas of high prosperity such as Cardiff and the Vale of Glamorgan (VG). In economic performance, this equated areas of Wales with Hungary as opposed to the rest of the UK (Renton, 2001). In 2003, there were only 21 publicly quoted Welsh companies with only 293 reporting annual sales in excess of £15 million (Huggins et al, 2003). Wales lagged behind most UK regions, with a rate for business start-up well below the national average. For example, in 2006 the average for UK regions registering new enterprises for VAT was 15,200 per region with London recording the highest with 34,800. Wales by contrast, registered only 6,600 new enterprises, which statistically was the worst performing region within the UK; with the exception of NI 4,400 and the north east 4,600 (DBERR, 2007).

Gross domestic product (GDP) per head in Wales was only 82% of UK's average, with earnings lagging behind the UK by 10% (EAP, 2000; NEDS, 2001; Miller et al, 2002; WERU, 2005). Indeed Wales suffered from low economic activity rates, with local markets dominating SMEs trading patterns (Jacobs and Dowsland, 2000). These issues must be

considered as significant underpinning negative influences that have contributed to the low utilisation levels of E-Business within Wales.

Collinson and Quinn (2002) and Beaver and Prince (2004) noted the increased interest from EU and national governments and SME funding agencies, as a generator of employment, economic wealth and social improvement. Within Wales, to encourage the development of the economy and the SME community, the Welsh Development Agency (WDA) launched the Entrepreneurial Action Plan (EAP) in 2000. The basis of this policy was to encourage entrepreneurial culture within SMEs in Wales, through increased business start-up and support activities, entrepreneurial training and learning opportunities, through a coordinated funding policy thereby encouraging business survival and growth (EAP, 2000; Jones-Evans, 2001). The effectiveness of the EAP (2000) in encouraging entrepreneurial behaviour in Wales was difficult to assess, given the limited available evidence. The evidence identified in Section 2.5 suggested attained economic growth through business start-up was limited.

In terms of developing E-Business activity specifically, the WAG developed and initiated the Cymru Arlein (2001) policy. This represented a commitment by the WAG to encourage E-Business usage within the SME community, namely: -

> *"Develop a Wales where all businesses, wherever they are located, are able to exploit information and communication technologies fully in order to improve their competitiveness, innovate and achieve highly sustainable growth."*
>
> (Cymru Arlien, 2001: 2)

The WAG claimed that Wales has been subject to significant economic regeneration, with 100,000 more people in employment since 1999 and rising earnings (WAG, 2005). The WAG recognised the importance of SMEs to the ongoing prosperity of the nation, with the creation of the Innovation Action Plan (2003) and EAP policies (WAG, 2005). Despite

these strategies, Wales has remained delineated by areas of high unemployment, social deprivation and economic inactivity, as considered in the next section.

2.5.1 Regional disparities within Wales

There was a wide disparity in economic performance in Wales, with significant regional and local variances apparent in economic structures and growth potential (NEDS, 2001; Bryan, 2005; WAG, 2005). The south east, centred on Newport and Cardiff, was relatively prosperous (WERU, 2005). Two thirds of the Welsh population however qualified for EU Objective One funding with an average GDP of 73% of the UK average, making such areas comparable with the poorest regions of the EU (NEDS, 2001; WERU, 2005). The recognition of Objective One status was accompanied by structural funds support from the EU, to enhance regional policy (EC, 2007). In Wales the following regions were allocated Objective One status between 2000 and 2006 and were therefore eligible for structural funding (Figure Five):-

- Blaenau Gwent (BG)
- Bridgend
- Ceredigion
- Denbigh
- Merthyr Tydfil
- Pembrokeshire
- Swansea
- Ynys Mon/Anglesey.
- Carmarthenshire
- Caerphilly
- Conwy
- Gwynedd
- Neath Port Talbot
- Rhondda Cynon Taff
- Torfaen

These regions spanned the area between the Isle of Anglesey in the north of Wales and the valleys in the south with a total population of 1.867 million people. Within the EU, these areas were collectively known as West Wales and the Valleys (Figure Five, yellow shaded areas). The Objective One programme in this area focused on six priorities namely:

developing and expanding the SME base, increasing innovation and the knowledge based economy, community economic regeneration, improving people, rural development and the sustainable use of natural resources and strategy infrastructure. The remaining LAs of Wales were covered by Objective Two and Three structural funds (Figure Five, white shaded areas). These regions, with a combined population of 1.050 million, were collectively known as East Wales and included: -

- Cardiff
- Monmouthshire
- Powys
- Wrexham.
- Flintshire
- Newport
- Vale of Glamorgan.

The Objective Two programme focused on three priority areas: developing competitive and sustainable SMEs, sustainable rural development; and urban community regeneration (WEFO, 2007).

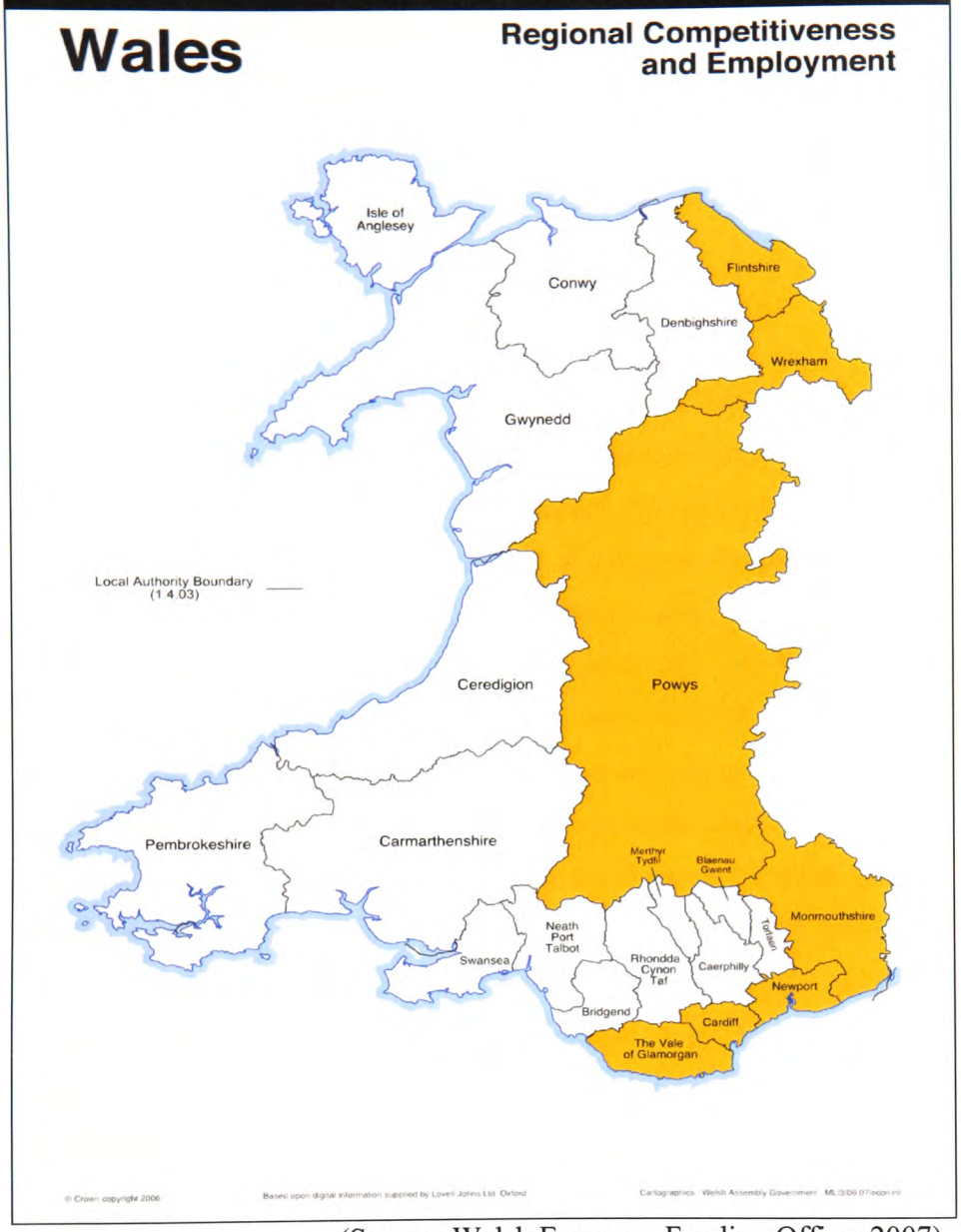
In the south Wales valleys, activity rates, output per head and average wage levels were all inferior compared to the rest of Wales and the UK as a whole (NEDS, 2001; David et al, 2003). LAs with unemployment and economic inactivity above the national average included: MT, BG, Anglesey and Pembrokeshire (NEDS, 2001). In urban and rural areas, there were still severe pockets of deprivation and poverty, with above average youth unemployment, high levels of disaffection and long-term unemployment (NEDS, 2001; Miller et al, 2002). The south Wales valleys were relatively successful in manufacturing, but contrastingly weak in maintaining the service sector growth and portrayed a bleak picture of an under-performing economy with low economic activity rates, high sickness levels, poor housing and inferior educational attainment (NEDS, 2001).

The WAG (2005) identified Wales as having one of the lowest skills profiles in the UK, with only 15.2% of the working population (UK

average 17.8%, ranked seventh out of 12 UK regions) possessing a degree or equivalent qualification and 17.4% without qualifications (UK average 15.2%, ranked ninth out of 12 UK regions). Rural areas of Wales, such as Pembrokeshire and Ceredigion, suffered specific problems with the continuing decline of agriculture, a small, dispersed and aged population and poor accessibility to urban areas (Clifton, 2000; NEDS, 2001). The West Wales economy has remained dominated by self-employment and by micro-sized SMEs with an ongoing reliance on the agricultural sector (Clifton, 2000). Furthermore, there were problems of under-employment and waged poverty due to low income, casual, seasonal and part-time employment (NEDS, 2001). Even within the prosperous areas of Cardiff and Newport, there was substantial concentrations of low incomes, insufficient economic activity and social exclusion prevalent (NEDS, 2001; Bryan, 2005).

In summary, Wales' unique economic circumstances and inferior economic performance contrasted significantly with other UK regions. The Welsh economy has suffered from a large number of inherent weaknesses including low skills, minimal exploitation of E-Business within industry and high business failure rates. To improve these factors, the SME sector has become the focus of regeneration strategies by the WAG (WAG, 2005). This process was initiated by a raft of new strategies and policy declarations from the WAG, to encourage business start-ups and enable growth within existing SMEs (WAG, 2003). The ability of individual SMEs to effectively use E-Business technologies, was reflected in the resultant impact upon the economy. A forecast of economic impact suggested broadband utilisation would benefit the private sector within Wales by £1,135,000 by 2015 (Atkins Management Consultants, 2006).

Figure 5 : European Structural Funds in Wales by Local Authority 2000-2006



(Source: Welsh European Funding Office, 2007)

The SME sector will continue to represent an important generator of both employment (over 700,000) and economic wealth (in excess of £55 million) for Wales (SBS, 2003). However, the high failure rates of SMEs, low rates of entrepreneurial activity and questionable effective utilisation of E-Business, meant the economy was under performing. For the process of statistical analysis, the UK and European governments classified Wales as a region (Eurostat, 2002; DTI, 2004; SBS, 2005a).

Such terminology was applied within this study to enable comparative analysis with other UK regions (Section 3.8). Having evaluated the Welsh economy and recognised its economic under performance, it was critical to assess the usage of E-Business within the SME sector. The next section considered the emergence of the Internet and its uses for business purposes.

2.6 The Internet and its Emergence

Montealegre (1998) described the Internet as a protocol enabling heterogeneous computers and protocols to communicate, thus enabling local area networks to combine. The Internet was developed during the 1960s by the United States Department of Defence Research Projects Agency (Cockburn and Wilson, 1996; Boyes and Irani, 2002) and thereafter become integrated globally into everyday activities such as leisure, health and work and by business enterprises (Reynolds, 1998; Teo and Tan, 1998). The growth of the business use of the Internet in recent years has been unprecedented, having taken just five years to reach 50 million global users, in contrast to 38 years for radio and 13 years for television (Bell and Tang, 1998). The Internet World Stats (2007) approximated that worldwide there were in excess of 1,154 million people with access to the Internet. Europe contributed approximately 322 million of these users, equating to 27.9% of the total world population and 39.8% of the European population.

Within the UK, Internet World Stats (2007) identified approximately 37 million users. This indicated a growth rate in individual uptake of 144% since 2000 and a UK population penetration rate of 62%. Internet usage in Europe had grown by 206% since 2000, a trend that was expected to continue. The unprecedented growth of the Internet caught many SME Owner/Managers unaware, with enterprises finding it difficult to incorporate it within their business operations. Anumba and Ruikar, (2002) determined that the Internet, has revolutionised the way in which information was stored, exchanged and viewed. In the UK, trends

revealed ongoing growth in the number of Internet connections. Evidence suggested that dial up connections were in rapid decline, accounting for 43% of all connections, in comparison to broadband which contributed 57% (Walsh and Norton, 2004; First Release, 2005). Forrester Research estimated that the global E-Commerce market was worth $1.49 trillion by 2003 (Lee et al, 2002). This growth was encouraged by an increase in the number of online businesses, from 150,000 in 1995 to 2,000,000 in 2000 (Owens and Robertson, 2000). Within the UK, Ottens (2004) identified a high usage of the Internet within enterprises. In Wales, eCIC (2005) noted that 66% of SMEs had an Internet connection and 5% planned to introduce one within the year.

Table Five indicated that Internet usage within enterprises was generally increasing, but was inferior within the smaller SME sized classifications. As evident in Table Five, there was no consideration of "Sole-Proprietor" classified enterprises within this analysis, which was another example of its under representation within the published literature. This phenomenon was replicated within Wales whereby the micro-sized SME classifications demonstrated lower levels of Internet usage (eCIC, 2005). The evidence suggested Internet uptake was improving, offering the potential of increased competitiveness and profitability for the SME sector (Levy and Powell, 1999). The increased business usage of the Internet had resulted in the development and utilisation of a number of new concepts to describe the phenomenon, such as E-Commerce and E-Business. These concepts were explained in the following section.

Table 5: Internet usage by Enterprises within the UK in 2002 and 2003 as a Percentage

SME Size Category by employees	Year 2002	Year 2003
10+	74	81
10-49	70	77
50-249	91	94
250+	97	99

(Source: Ottens 2004: 3)

2.7 Defining E-Business and E-Commerce

The usage of IT/IS through the Internet has resulted in the emergence of a multitude of new terms to define and describe the phenomenon. Currie (1998) described the growth of the Internet as a new paradigm for business, yet the terminology remains prodigious and contradictory (Holsapple and Singh, 2000; Wilkins et al, 2000; Chuang and Shaw, 2005). Terms such as E-Commerce, E-Business, Internet commerce and web commerce have grown in prominence (Barnes et al, 2004; Fillis and Wagner, 2005). Enterprise activity within electronic markets has been typically referred to as electronic business (E-Business) or electronic commerce (E-Commerce) (Turban et al, 2000). Three frequently used terms were E-Commerce, E-Business and I-commerce (Turban et al, 2000). Kalakota and Whinston (1996: 1) defined E-Commerce as the: -

> *"...buying and selling of information, products and services via computer networks."*

Whilst Sewell and McCarthey (2001: 214) defined E-Business as:-

> *"Business facilitated by the exchange of information across electronic networks. E-Business is about using the convenience, availability and worldwide reach of ICT to enhance existing business or create new business."*

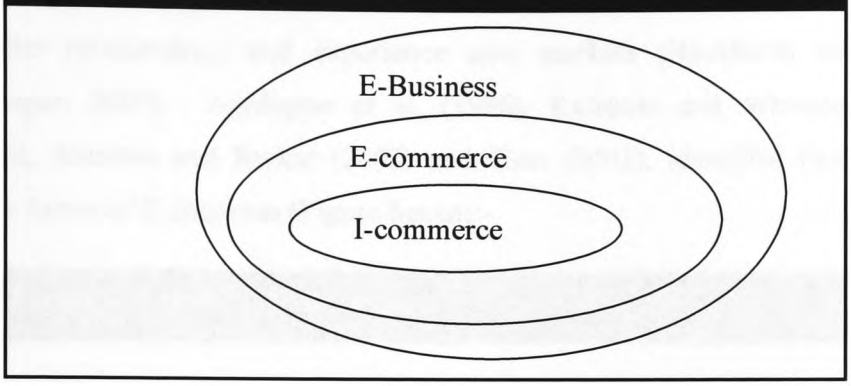
Brown and Lockett (2004: 22) concluded that E-Business as a concept had matured and could be defined as: -

> *"... the use of inter-organisational electronic networks to transact, process and collaborate in business markets."*

E-Business therefore described an all-organisation transformation concept in relation to IT/IS usage, with the capability of connecting processes, enterprise applications and influencing organisation structures (Al-Qirim, 2003). Whilst Beynon-Davies (2002) described Internet

Commerce or I-commerce as the use of Internet technologies to enable E-Commerce. Within the remit of this study, E-Commerce was regarded as a superset of I-commerce and a subset of E-Business (Figure Six). The following definitions were applied: -

Figure 6: Classification of E-commerce, E-Business and I-commerce



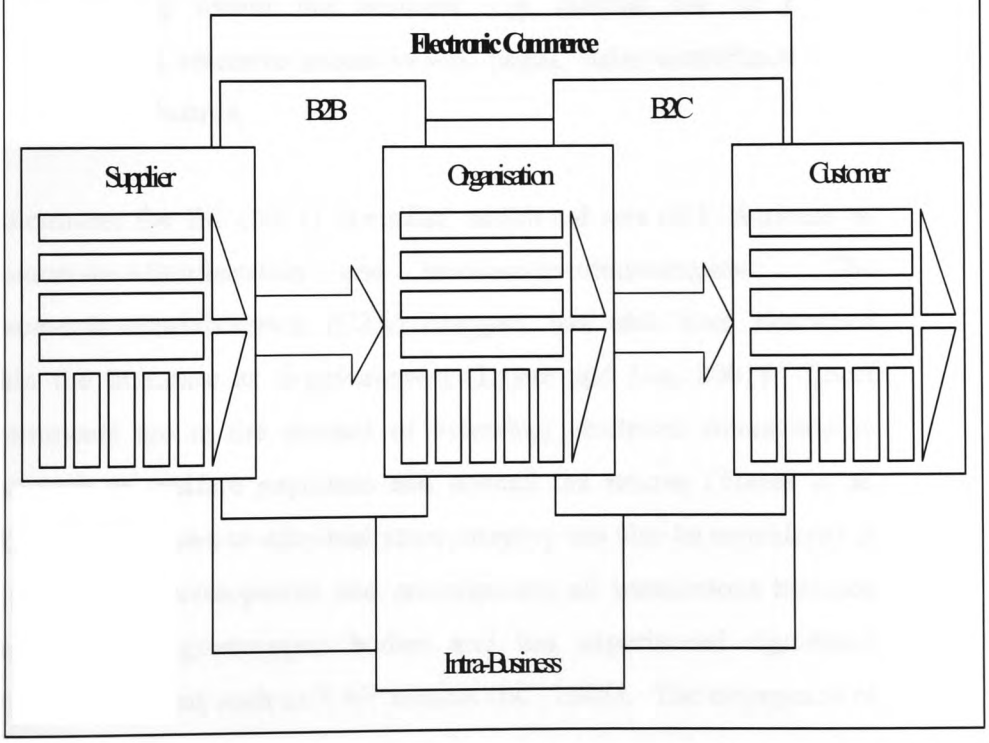
(Source: Beynon-Davies, 2002: 14)

- E-Business could either be considered as an entity or as the set of activities associated with a commercial organisation. E-Business was treated as the utilisation of ICT to support all the activities of business rather than by physical exchanges or direct physical contact (EC, 2003). E-Business thus incorporated E-Commerce (Brown and Lockett, 2004)
- E-Commerce constituted the exchange or sale of products and services between businesses, groups and individuals. Commerce or trade could be regarded as one of the essential activities of any business. E-Commerce focused on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses (Bontis and De Castro, 2000)
- I-commerce was defined as the use of Internet technologies to enable E-Commerce. Such technologies were the key standards for intra and inter-organisational communication (Beynon-Davies, 2002).

2.7.1 Forms of E-Business

Kalakota and Robinson (2000) and Ng (2005) reported the growing importance of E-Business to enterprises, with increasing numbers developing their electronic capability to enhance and enable their business processes. E-Business has been deployed like other technologies, capitalising on its benefits to enhance customer and supplier relationships and experience new markets (Hackbarth and Kettinger, 2000). Applegate et al, (1996), Kalakota and Whinston (1996), Anumba and Ruikar (2002) and Phan (2003), identified three major forms of E-Business (Figure Seven):-

Figure 7: Forms of E-Businesses



(Source: Beynon-Davies et al, 2002a: 4)

1. Business-to-customer/consumer (B2C) E-Commerce - the use of ICT to enable forms of commerce between a company and its customers or consumers. The business-to-customer sector identified the electronic retailing market; an example being the use of the Amazon.co.uk website to purchase a book or compact

disc. This sector has experienced significant growth with the emergence of the Internet.

2. Business-to-business (B2B) E-Commerce - the use of ICT to enable forms of commerce between a business and its suppliers. An example of business-to-business would be an enterprise using a network for ordering from its suppliers, receiving invoices and making payments, or using the Internet to place an order from suppliers. Electronic Data Interchange (EDI) has been described as a long established application of this form of E-Business.
3. Intra-business E-Business - the use of ICT enabling communication and coordination between the internal stakeholders of the business. Intra-organisational identified all forms of electronic communication and business interaction occurring within the business, e.g. internal use of E-mail, intranets, selective access to web pages, video conferencing and bulletin boards.

Furthermore, the EC (2001) identified additional sets of E-Business as consumer-to-administration and business-to-administration. The consumer-to-administration (C2A) category has also been described within the literature as E-government (Layne and Lee, 2001). Local governments are in the process of extending electronic interaction in areas such as welfare payments and council tax returns (Torres et al, 2005). The business-to-administration category can also be considered in the process of development and encompasses all transactions between enterprises and government bodies and has experienced significant growth in functions such as VAT returns (EC, 2001). The emergence of online auctions websites such as eBay (http://www.ebay.co.uk) has resulted in the recognition of another category, namely consumer-to-consumer (C2C), whereby goods can be traded between consumers (Anumba and Ruikar, 2002). These distinctions were illustrated in Figure Seven. Within this conceptualisation of the enterprise, E-Commerce was seen to represent a subset of E-Business. The value chain of the enterprise in question linked with the value chains of

suppliers and customers, thus creating a value system (Porter and Millar, 1985). Between these key partners, the concepts of B2B and B2C trading were illustrated to differentiate the nature of such trade.

Within this thesis, the terms E-Business and E-Commerce, as defined within this section, were utilised to identify the technologies and their use within the enterprise. Similarly, the research instruments utilised within this study as described within Chapter Four, employed the above terms. The term E-Business included any form of electronic networks, the Internet, websites and several methods of electronic communication, e.g. electronic mail (E-mail), video conferencing or EDI. Wherever possible, the term E-Business was utilised as a means of describing the phenomena (Fillis and Wagner, 2005).

2.7.2 Using E-Business as an enabler to economic development

In 2000, the government launched the UK Online initiative, which reflected the desire of the EU (EU, 1999) to encourage business exploitation of the Internet (Martin and Matlay, 2001). The rationale for this strategy was to encourage the development of a knowledge economy, through increased business usage of the Internet, thereby enhancing enterprise growth and survival rates. Feher and Towell (1997), McDonagh and Prothero (2000) Trappey and Trappey (2001) identified that E-Business usage benefited small enterprises in coping with their operational environment and providing new opportunities. Thus, the role of E-Business could be regarded as an enabling mechanism to increase productivity, reducing costs and facilitating flexibility within the SME. A critical process was the successful deployment of E-Business within the SME sector. A number of business models were proposed as valid frameworks illustrating the development of this process (Morris et al, 2005). The next section appraised the levels of E-Business that could be attained through usage.

2.7.3 Levels of E-Business existence

The E-Business literature has noted the existence of different types of Internet usage in everyday business practices, which were often described as E-Business models. These E-Business models represented potential types of Internet presence and functionality which could be attained. Timmers (1999), Anumba and Ruikar (2001), Pant and Ravichandran (2001), Lam and Harrison-Walker (2003) and Rappa (2003), reported the existence of the e-shop, e-procurement, electronic auction (e-auction), electronic mall (e-mall), third party marketplace, virtual communities, value chain service provider, value chain integrator, collaboration platforms and information brokerage. An e-shop represented the web presence of an enterprise, which might exist as a marketing site or possibly offered the opportunity of online purchasing, ordering and payment.

Electronic procurement (E-procurement) represented the electronic tendering and procurement of goods and services typically undertaken by large enterprises or public authorities. E-auctions offered an Internet version of a traditional auction. The e-mall was a collection of e-shops, usually presented under a common portal. Within a third party marketplace, the web marketing was undertaken by a third party on behalf of the enterprise. This model would typically apply to banks or value chain service providers. Virtual communities were created by members within an Internet environment and designed to encourage interaction. Popular current web communities include You Tube (http://uk.youtube.com/), Bebo (http://www.bebo.com/) and Facebook (http://www.facebook.com). Communities of interest create an added value in a business context by providing a forum for comment and discussion. For example, the book reviews section within the http://www.Amazon.co.uk website would inform the consumer purchase decision. Such features are beneficial and provide added value to business models, such as e-auctions or e-malls.

Value chain service providers specialised in a specific function such as electronic payments or logistics. Value chain integrators focused on integrating multiple steps of the value chain, with the opportunity to exploit the information flow for added value. Collaboration platforms provided a set of tools and an information environment for interaction between enterprises and potentially included shared design, engineering and consultancy support. Information brokerage identified a range of online information services, such as investment advice and customer profiling, that an enterprise might potentially utilise.

Since Timmers (1999), several studies have proposed further classifications. Affuah and Tucci (2001), Strauss and Frost (2000) and Eisenmann (2002) identified 33 further types of E-Business existence model. However, such classifications could be identified as sub-categories of the 10 posited by Timmers and added minimal value to the clarity of the overall picture. To avoid over-complexity and to ensure consistency in terminology, the forms of E-Business existence identified within the Timmers (1999) model was utilised throughout this thesis. The applicability, attainability and usage of these levels of E-Business within the SME sector, will be considered within this thesis. Osterwalder and Pigneur (2002) suggested that further business development could be encouraged by utilising business models as a guide to effective enterprise utilisation, see following section.

2.8 Defining Business Models

Timmers, (1999), Mahadevan, (2000) and Morris et al, (2005) noted minimal consensus existed as to what represented a valid business model and a diversity of definitions were presented. A potential reason for this being the underlying model driving business development. Osterwalder and Pigneur (2002) and Gordijn et al, (2005) suggested several purposes for business models, including modelling social systems, helping to clarify and identify the elements and relationships within a process and

enabling model designers the opportunity to communicate and share their design with stakeholders, thereby facilitating change and improvement.

Alt and Zimmerman (2001) and Joyce and Winch (2005) observed that the term "business model" was widely utilised in academic literature and in business practices. Business models were utilised in academia as a means of understanding business and its environment and in business practice as a target of optimum or best practice towards which to aspire. Previously, Timmers and Gasós (1998: 193) defined a business model as consisting of:-

> *"The architecture of business processes or value chain steps, together with a description of the product or service, information and money flows. The business model should also list the business actors involved, their roles and the benefits they get. This approach also provides a methodology to construct new business models."*

Whilst Li and Whalley (2002: 460) described the business model as:-

> *"The architectural configuration of the components of transactions designed to exploit business opportunities."*

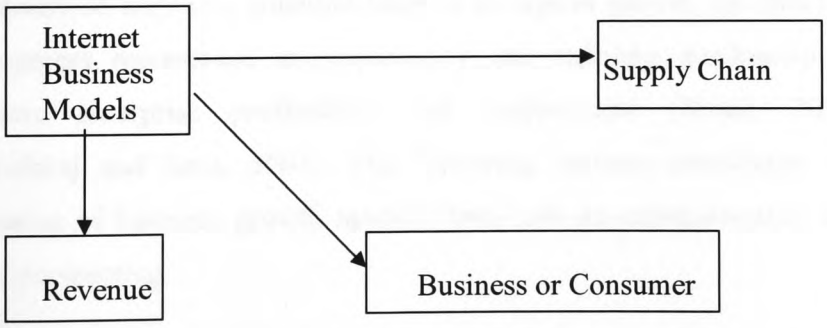
Using a combination of these definitions, enabled this thesis to examine and model the behaviour of the SME sector in the context of E-Business usage. The model identified the key elements within this framework including the key actors and the inter-relationship between the variables therein.

Section 2.9.2 of this thesis identified the role of Nolan's (1979) framework and its successors as SoGMs designed to track IT/IS growth within enterprises. A driving force behind the re-consideration of the role of business models has been the emergence of the Internet and its usage within business practices (Joyce and Winch, 2004). Affuah and Tucci, (2001) described an E-Business model as how an enterprise planned to make money over a long term utilising the Internet. Joyce and

Winch (2005) noted that the focus of this re-evaluation was the impact of IT/IS and how it altered existing business models and strategy. Mahadevan (2000) and Rappa (2003) identified the existence of a number of Internet Business models including focus upon supply chain, revenue and business or consumer markets. Chen (2003) suggested a driving factor behind E-Business uptake was attributed to usage of novel Internet business models. Wen et al, (2001), Chen (2003) and Osterwalder et al, (2005) reported that many web design models existed on the Internet and new models were appearing expeditiously. Therefore, an E-Business SoGM was regarded as a variant of a business model and a mechanism to assist SME Owner/Managers envisage and manage the technology adoption process as represented within Figure Eight. For the purposes of this study, SoGMs were described as: -

> *"Approaching E-Business through a series of stages, in a well-planned, sequential process."*
>
> (Martin and Matlay, 2001: 400)

Figure 8: Existence of Internet Business Models



Thus, the purpose of an E-Business SoGM was to chart the usage from a minimal to a high degree of usage, providing a set of descriptors at every level (Subba Rao et al, 2003). However it was apparent after reviewing the literature (Section 2.9) that such frameworks lacked relevance and applicability to the experience of the SME Owner/Manager within the micro sized SME and further research was required to understand the realities underpinning adoption and deployment. The applicability and

relevance of alternative technology adoption frameworks to SME Owner/Managers was considered within Chapter Seven. The next section considered frameworks that have been developed and utilised to evaluate organisational growth of E-Business from both an entrepreneurial and IT/IS driven perspective.

2.9 The Growth of the Small Business

As identified within the previous section, the purpose of this study was to evaluate E-Business usage within the SME sector. As a result, it was necessary to consider how enterprises adopted and grew the E-Business function to understand the utilisation behaviour. Business growth was considered from multiple perspectives. Generic business growth has often been measured in terms of increased employment (Smallbone and Wyer, 2000; Hoogstra and van Dijk 2004), although Delmar and Davidsson (1998) argued that few studies recognised this reality. In terms of the perspective of the SME Owner/Manager, increased profitability and sales turnover was of greater significance to the individual enterprise (Smallbone and Wyer, 2000). Whilst E-Business characterised only one potential facet of enterprise growth, its effective deployment represented an opportunity and enabling mechanism to increase enterprise profitability and employment (Brock, 2000; Bharadwaj and Soni, 2007). The following sections considered the relevance of business growth models from both an entrepreneurial and IT/IS perspective.

2.9.1 Enterprise growth from an entrepreneurial perspective

Academic research has typically regarded SME growth as a series of conceptual phases or stages of development through which the business passed in an enterprise life cycle (McMahon, 2001; Hui-Hong and Tan, 2004). The entrepreneurial literature recognised a number of models in relation to generic business growth. McMahon (1998) and Beaver (2002) reported the existence of a number of such models, whereby an enterprise

passed through a number of phases during its life cycle. Within such stages, the enterprise evolved in terms of complexity and sophistication of organisational structure and design, management practices and strategic development. The seminal and most cited growth models included Steinmetz (1969), Greiner (1972), Galbraith (1982) and Churchill and Lewis (1983) (Figure Nine). The Greiner (1972) framework described a five-stage model that recognised the growth changes within the enterprise, in relation to the role of the manager.

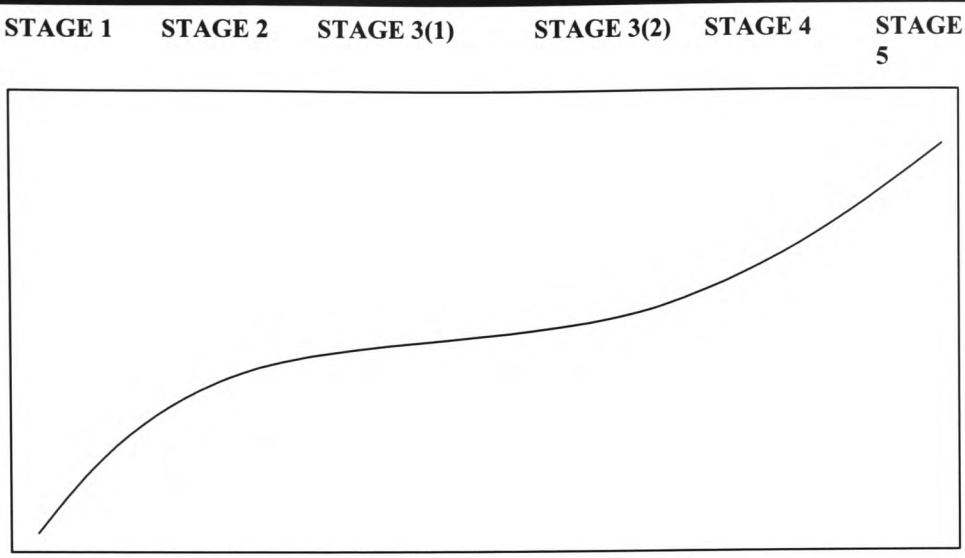
The Churchill and Lewis (1983) model (Figure Nine) considered the marketing, people and financial management functions against enterprise growth. Scott and Bruce (1987) proposed a five-stage model that recognised the appropriate management role, style and organisational structure at different stages. Chell and Haworth (1992) suggested a three-stage model comprising post start up, established and professionally managed phases. Burns (1996) summarised the main business imperatives of enterprise growth, in terms of its orientation and the main disciplines of management, marketing, accounting and finance. Such rigid models however, have attracted a degree of criticism; Freel (1999) identified inherent flaws in their design. It was apparent that five key criticisms were recognised within the literature:-

- the majority of SMEs experienced minimal or no growth (Storey, 1994; McMahon, 1998). Extant literature suggested that SME Owner/Managers did not have the desire, or indeed the capability in terms of resources and expertise, to grow their enterprises (Stanworth and Curran, 1986; O'Farrell and Hitchens, 1988; Perry et al, 1988; Storey et al, 1988; Davidsson, 1989; Birley and Westhead, 1990; Turok, 1991; Hay and Kamshad, 1994; McMahon, 1998)
- such growth models did not support regressive movement, avoidance of certain stages or recognised whether variations in sequencing occurred (McMahon, 1998; O'Gorman, 2001). Beaver (2002) suggested that the requirement to complete a stage before moving

forward was simplistic and limiting. Freel (1999) noted that many enterprises only achieved the take off stage and thereafter were involved in a permanent fight for business survival and sustainability. The recognition of regression in the use of IT/IS within the enterprise must also be considered (McMahon, 1998)

- due to the limitations of their construction, such models did not enable enterprises to exhibit characteristics from a number of stages, which was unrealistic (Stanworth and Curran, 1986; O'Farrell and Hitchens, 1988)
- the classifications of the various stages was limiting and inaccurate and did not reflect the operational and strategic realities and capabilities of SMEs. Stage models typically measured enterprise size in sales revenue or employee numbers, and they usually disregarded other measures of attainment such as product mix, value added and rate of innovation (Burns and Harrison, 1996; McMahon, 1998). Moreover, Gibb and Scott (1985), O'Farrell and Hitchens (1988) and Gibb and Davies (1990) recognised that SoGMs often underestimated the significance of externalities, business relationships, regional differences and non-traditional measures of performance to the process of growth
- stage models typically failed to capture early stages in the initiation of micro-sized SMEs, including prior to start-up. The focus of attention was generally on already well established enterprises making significant progress to becoming medium-sized SMEs (McMahon, 1998).

Figure 9: The Churchill and Lewis growth model (1983)



	Existence	Survival	Disengagement	Growth	Take-off	Maturity
Management Style	Direct supervision	Supervised supervision	Functional	Functional	Divisional	Line and staff
Organisation	Simple	Growing	Growing	Growing	Growing	Sophisticated
Extent of formal Systems	Minimal to non existent	Minimal	Basic	Developing	Maturing	Extensive
Major Strategic Imperative	Existence	Survival	Maintaining Profitable Status Quo	Obtain Resources for growth	Growth	Return on Investment

(Source: Churchill and Lewis 1983: 34)

Additionally, Gibb and Davies (1990), Gray (1993) and McMahon (2001) discovered that the models contained unsupported assumptions, lacked empirical verification and ignored the reality of SME management, whereby internal functional divisions and professional management were unfeasible aspirations. Although Gray (1998) was critical of the rigidity of such frameworks, he recognised that stages models provided some understanding of the process of SME growth. Furthermore, Gray (1998) and Ennis (1999) recognised that business objectives, motivations and expectations of entrepreneurs were a key determinant in recognising the complexity of business growth. Beaver

and Jennings (1995) noted the importance of strategic planning as the central necessity underpinning growth within the SME.

The reality within the SME sector suggested attaining long-term business survival and sustainability, rather than growth, was the overriding objective in the majority of enterprises, especially when the business failure rate identified within Section 2.3 was considered (McMahon, 1998; Anderson et al, 2001; Clark et al, 2001; Gray, 2002). A prime cause of this scenario could be related to the knowledge and understanding of the Owner/Manager. Mazzarol (2004: 1) noted: -

> *"...the majority of small firms are led by Owner/Managers who are strategically myopic and lack the long term vision required for Owner Managers to identify the future direction of the business".*

Evidence suggested that most enterprises experienced minimal or zero growth (Feindt et al, 2002; Kirby, 2003) and the process was not simple or a natural progression (Ennis, 1999). Dobbs and Hamilton (2007) noted that sustained growth was a rare phenomenon and when it did occur, its behaviour was represented by periods of fluctuation and stagnation. Bolton and Thompson (2000) concluded that there was a lack of consideration and awareness of the process. Glancey (1998), Irwin (2000) and Gray (2004), recognised that not all SME Owner/Managers wanted to grow their enterprises and many were incapable of achieving growth.

Indeed, Gray (2002) reported that sole trader type SMEs revealed a strong tendency to be growth averse. The reasons for this were multitude, ranging from personal ambitions regarding lifestyle and reluctance to release control in order to maintain ownership in the long term (O'Farrell and Hitchens, 1988; Davidsson, 1989; Hay and Kamshad, 1994; Holmes and Zimmer, 1994; McMahon and Stanger, 1995; Ennis, 1999; Kotey, 2005). Within the entrepreneurial literature, it was accepted that job creation within SMEs, occurred within a minority

of businesses (Stanworth and Curran, 1976; Burns and Dewhurst, 1996; Glancey, 1998; Morrison et al, 2003). Dobbs and Hamilton (2007) identified that policy makers worldwide have continued the process of attempting to identify and support the productive and innovative SMEs that are likely to achieve growth and increase employment opportunities. This study examined whether this evidence was relevant in terms of generic business growth within an E-Business context. Having considered the key entrepreneurial growth literature, there was a need to evaluate the IS literature and to examine the growth of IT within the enterprise, which was considered within the next section.

2.9.2 Enterprise growth from an information technology/information system perspective

The increased use of IT to enable and develop organisational IS, has long been recognised as an opportunity to augment enterprise and increase productivity, efficiency and competitiveness, thereby attaining enterprise growth (Man et al, 2002; Aragón-Sánchez and Sánchez-Martin, 2005). Several development models considered IT/IS development, including Earl (1989) and Galliers and Sutherland (1991). Despite criticism (Benbasat et al, 1984), SoGMs remain a popular framework for describing enterprise development, the most cited being Nolan's model.

Nolan and Gibson (1973) developed a SoGM that presented a way of understanding the development and sophistication of IT/IS use and management (Nolan, 1973; Gibson and Nolan, 1974). This model proposed that an enterprise moved through several stages of maturity with respect to the use and management of IT/IS (Nolan, 1979). The model offered an attempt to aid managers' interpretation of the position of IT/IS within the enterprise. Nolan and Gibson's initial model contained four stages of growth, although two additional stages were subsequently added (Nolan, 1979) (Figure Ten). Nolan's model has been widely utilised by consultancy firms, including IBM's IS planning process (Galliers and Sutherland, 2003). Galliers et al, (1998) stated that

the model represented a useful and influential framework for evaluating the process of IS development in organisations although it has been criticised on several levels.

King and Kraemer (1984) queried the empirical construction and intellectual basis of the model. Benbasat et al, (1984) suggested that the benchmark variables found within the stages were not empirically verified. Curtis and Cobham (2002) identified that the model was based on empirical research undertaken in the 1970s and did not consider the impact of technologies that had been subsequently developed including E-Business. Moreover, Curtis and Cobham (2002) identified that the model concentrated on database technology and did not consider the emergence and increased usage of PCs, networks and software development and decision support tools. In addition, it was criticised as being too simplistic and inconsistent (Goldstein and McCririck, 1981; Drury, 1983; King and Kraemer, 1984; Stubbart and Smalley, 1999; Street and Meister, 2004).

Further to this argument, several entrepreneurial studies have suggested that SMEs did not pursue the concept of organisational growth (Section 2.7.2). Therefore, by association, the applicability of a linear growth model to represent IT/IS development could be considered a flawed concept, if the enterprises' strategy towards IT/IS investment remained unchanged (Cragg and King, 1993). Several studies however, have suggested Nolan's SoGM was worth testing within the SME sector (Goldstein and McGririck, 1981; King and Kraemer, 1984; Cooley et al, 1987; Stair et al, 1989).

Ward and Griffiths (1996) and Prananto et al, (2001) identified that the Nolan model was of value to chart ICT development within an enterprise. Whilst heavily criticising the Nolan model, King and Kraemer (1984) praised the framework for recognising the influence of internal and external forces on the IT adoption process. Curtis and Cobham (2002) recognised that the Nolan model did provide a way of viewing the usage

of IS by identifying a number of development factors. These factors included that the growth of IT/IS must be accompanied by an enterprise learning process, the recognition of the need for control and utilisation of slack resources and the concentration on data management (Curtis and Cobham, 2002). ICT development has continued rapidly and, with that, its importance to the enterprises has increased. Opportunities exist to improve enterprise links with customers and suppliers and shorten value chains.

Therefore, the effective use of ICT can potentially create strategic advantage within enterprises. Such, strategic advantage could only be achieved by enterprises integrating ICT operational requirements within their business planning processes (Tallon, 2008). Nolan's model predated use of the Internet as a business medium and must be significantly reappraised to provide a suitable framework for E-Business utilisation within an enterprise. In addition, Nolan's model was also more indicative of IT and ICT usage within large enterprises and less relevant towards SMEs.

The Nolan model suggested a linear framework, whereby an enterprise developed its ICT function from a low level of usage to a high degree of aptitude and capability. It was questionable whether a linear model was applicable to the SME sector, and this required further investigation. Earl (1989), Hirscheim et al, (1988) and Galliers and Sutherland (1991) all recognised that the growth of IT/IS occurred through maturity within increasing stages of growth. Earl (1989) identified a stage-planning model that concentrated on the tasks and objectives of planning at each stage. This model was an adaptation of the Nolan model, but was an improvement, in that it recognised the need for strategic planning at every level within the model. This model predated the use of Internet technology and the development of E-Commerce and E-Business and therefore should be appraised with this consideration. Two further frameworks worthy of further consideration included Davis (1989) and Venkatraman (1994). Davis (1989) TAM addressed IT adoption,

implementation and diffusion in terms of perceived ease of use and usefulness based on behavioural intentions of the key decision maker. Venkatraman's (1994) hierarchical model of business transformation enabled by IT usage, proposed five levels of transformation, each based on an increasing level of integration between IS, initially within the enterprise and then with external systems. Venkatraman posited that enterprises attained increased benefits, the higher the level of integration, although this required subsequent higher levels of organisational change.

Figure 10: Nolan's (1979) Six stages of data processing growth

Growth Processes						
Applications Portfolio	Functional cost reduction applications	Proliferation	Upgrade documentation and restructuring of existing applications	Retrofitting existing applications using data base technology	Organisation Integration of applications	Application integration "mirroring" information flows
DP Organisation	Specialisation for technological learning	User-orientated programmers	Middle management	Establish computer utility and user account terms	Data Administration	Data resource management
DP planning and control	Lax	More lax	Formalised planning and Control Transition Point	Tailored planning and control systems	Shared data and common systems	Data resource strategic planning
User Awareness	"Hand off"	Superficially enthusiastic	Arbitrarily held accountable	Accountability learning	Effectively accountable	Acceptance of joint user and data processing accountability.
Level of DP awareness						
	Stage I Initiation	Stage II Contagion	Stage III Control	Stage IV Integration	Stage V Data Administration	Stage VI Maturity

In summary, the Nolan model and its derivatives have provided the recognised basis for IT/IS development within enterprises for the last four decades. Such models proposed a linear development, with the

enterprise moving in stages from a position of low or no utilisation to a level of high competence. However, a significant body of evidence has emerged within the literature to refute the relevance of such frameworks to the experience of the SME in their adoption and usage of E-Business (Kai-Uwe Brock, 2000; Fallon and Moran, 2000; Martin and Matlay, 2001). These authors recognised a tendency for simplification, generalisation and for models to lack sophistication and consideration of key facets. Therefore there is a need to further explore the deployment of E-Business within the SME especially within the under researched micro sized enterprises.

2.10 Summary

This aim of this thesis was to understand E-Business usage within the SME sector. To this end, this chapter served several purposes. Firstly, the chapter defined the key concepts under investigation, namely IT/IS, SMEs, E-Business, growth models and the Owner/Manager. Secondly, the chapter evaluated the focus of the study, namely Wales, to ensure appropriate framing. This chapter identified the reliance of the Welsh economy on the SME population. Within this business environment, the central importance of the Owner/Manager towards the success of the SME business enterprise was established. The evidence emerging from Wales suggested that the Welsh SME population was underperforming in comparison to other UK regions. The emergence of the Internet as a business platform was evaluated. Thereafter, the nature and relevance of business models from both an IT/IS and entrepreneurial perspective was appraised. The next chapter considered E-Business literature in the context of the SME sector.

Chapter 3:

E-Business Usage and Uptake within SMEs - the Literature

Chapter 3: E-Business Usage and uptake within SMEs – the Literature

This chapter reviewed the pertinent literature regarding E-Business deployment within the SME sector, with particular reference to usage within Wales, as identified within Chapter One. The critical review involved three key elements. Firstly, to review the relevant literature, with reference to IT/IS and E-Business usage within the SME community. Secondly, to identify the usage and uptake of E-Business within Welsh SMEs based on analysis of academic, private and public sector surveys. Finally, the review refined the design of the research questions presented at the end of this chapter, which provided focus for the primary research undertaken within this thesis.

The literature identified the critical issues influencing E-Business usage within the SME sector. Furthermore, the development of E-Business, through a critique of the literature considering the preceding influence of IT/IS on SMEs and the need for strategic alignment of this function with business objectives was appraised. Thereafter, the emergence of E-Business, its impact on the SMEs community in terms of benefits attainable and barriers to further development, were identified. Levels of E-Business within SMEs in Wales were evaluated through the analysis of recent surveys. Finally, the research questions for this thesis were formulated and developed from the previously identified (Section 1.0) aim and objectives for this thesis.

3.1 The Impact of IT/IS within SME sector

This section identified the extant research investigating the diffusion of IT/IS within the SME sector, to provide a longitudinal critique of its emergence and impact. Several models have been proposed to investigate and understand the factors affecting user acceptance, adoption and usage behaviour within organisations (Ndubisi and Jantan, 2003). Rogers' (1983), (1995) and (2003) considered the diffusion of innovations and this work has been extended into the discipline of IT/IS

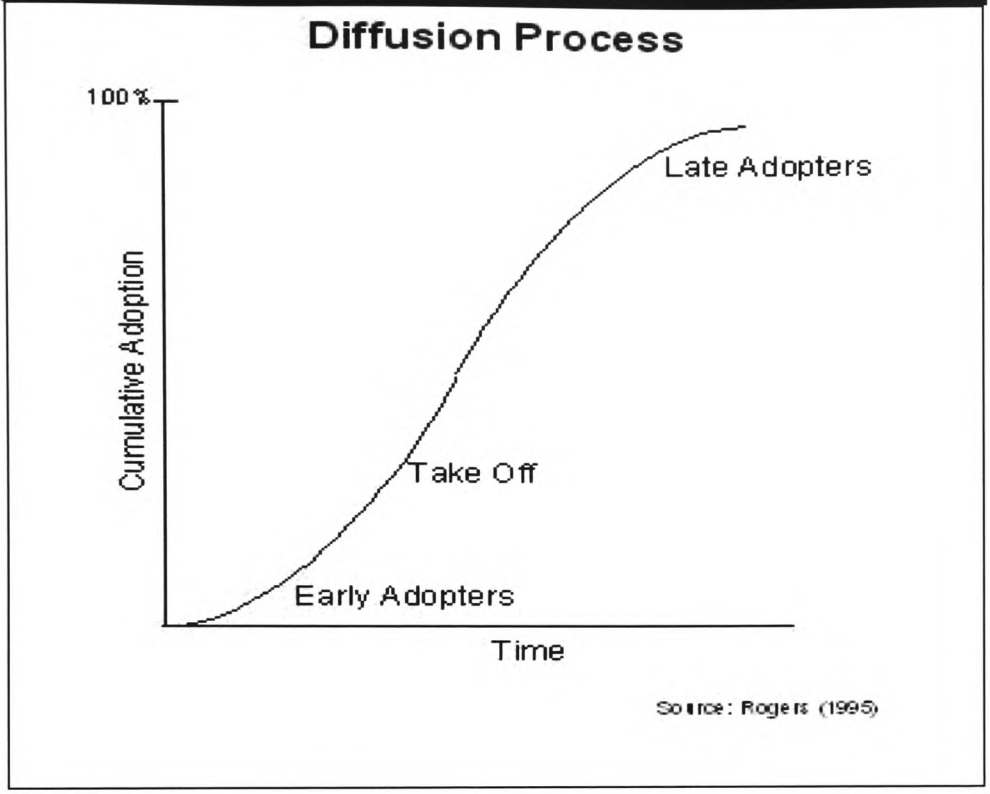
within the context of SMEs (Lockett and Brown, 2003a). Rogers' adoption model (Figure 11) considered:-

- Relative advantage was the degree to which an innovation was perceived as better than the idea it superseded.
- Compatibility was the degree to which an innovation was perceived as being consistent with the existing values, past experiences and needs of potential adopters.
- Complexity was the degree to which an innovation was perceived as difficult to understand and use.
- Trialability was the degree to which an innovation may be experimented with on a limited basis.
- Observability was the degree to which the results of an innovation were visible to others (Rogers and Scott, 1997).

Rogers proposed that adopters of any new innovation or idea could be categorised as innovators (2.5%), early adopters (13.5%), early majority (34%), late majority (34%) and laggards (16%). Such categories, based on standard deviations from the mean of the normal curve, provided a common language for innovation researchers.

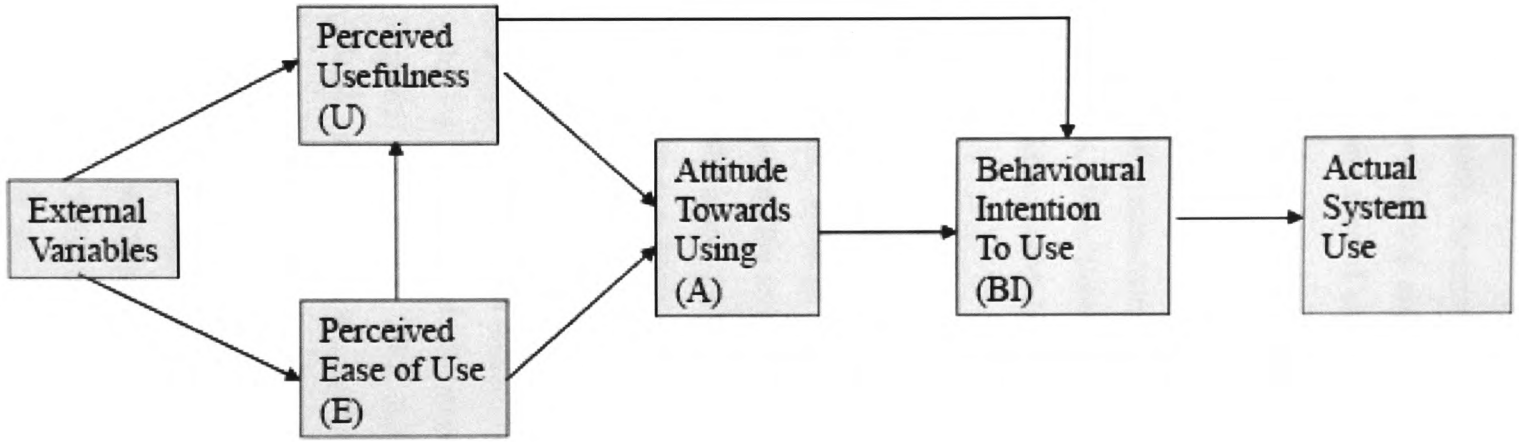
When graphed, see Figure 11, the rate of adoption formed, what came to typify the diffusion of innovation model, a "S shaped curve". The graph essentially shows a cumulative percentage of adopters over time – slow at the start, more rapid as adoption increases, then levelling off until only a small percentage of laggards had not adopted (Rogers, 1983; 2003). Both Bacon (1992) and Rogers (1995) highlighted cost as an important determinant of IT adoption. Closely associated with the Rogers' model was the TAM (Horton et al, 2001). The TAM model (Davis, 1989; Davis et al, 1989) enabled greater understanding of the relationship between user perceptions of the benefits and usability of their system (Figure 12).

Figure 11: Rogers Diffusion of Innovation Model



TAM was derived from the theory of reasoned action (Fishbein and Ajzen, 1975; Ajzen and Fishbein, 1980), to understand the linkage between external variables and technology usage intention and actual usage within the workplace (Ndubisi and Janta, 2003; Baron et al, 2006). Calantone et al, (2006) noted that manipulation of external variables by managers enabled a greater control over adopter's beliefs and their behavioural intentions towards system usage. TAM contains two central tenets namely perceived usefulness and perceived ease of use. Perceived usefulness referred to the user's perception of the degree to which utilising the system would improve an individual's job performance within the workplace (Ndubisi and Janta, 2003; Baron et al, 2006).

Figure 12: Technology Acceptance Model



(Source Davis et al, 1989:320)

This included how clear and understandable the interaction was with the system, ease of getting the system to do what was required, mental effort necessary to interact with the system, and ease of use of system (Davis, 1989; Davis et al, 1989). Whilst perceived ease of use referred to the user's perception of the amount of effort required to use the system (Lu et al, 2003; Ndubisi and Janta, 2003). Knowledge of perceived usefulness and apparent ease of use of system usage was essential, as they were determinants of usage (Davis, 1989; Mathieson, 1991; Adams et al, 1992; Segars and Grover, 1993; Sjazna, 1994; Igbaria et al, 1997).

TAM was acclaimed for its parsimony and predictive powers (Legris et al, 2003; Ndubisi and Janta, 2003; Calantone et al, 2006), which made it easy to apply in different situations; although Venkatesh (2000) suggested it did not assist to help understanding and explain acceptance in ways that guided development. Furthermore, TAM was acclaimed as well established and robust (Venkatesh and Morris, 2000), due to its several applications and replications. For instance, TAM has been utilised within a number of different contexts (Deng et al, 2005) to examine the issue of user acceptance (Ndubisi and Janta, 2003). TAM utilisation was recorded within a diversity of technologies and applications including PCs (Agarwal and Prasad, 1999, Igbaria et al, 1997), groupware (Taylor and Todd, 1995) intranets (Horton et al, 2001), voice mail (Segars and Grover, 1993; Straub et al, 1995), outsourcing decisions (Benamati and Rajkumar, 2002) and application software (Mathieson, 1991; Adams et al, 1992; Hendrickson et al, 1993; Venkatesh, 1999; Venkatesh and Davis, 2000). This has been extended to consider the development of the Internet (Gefen et al, 2003; Monsuwe et al, 2004), World Wide Web (Lederer et al, 2000), online banking (Pikarainen et al, 2004), mobile commerce (Snowden et al, 2006), wireless Internet (Lu et al, 2003), websites (Castaneda et al, 2007) and online retailing (Pavlou, 2003; McKechnie et al, 2006). Recently, Venkatesh and Davis (2000) extended the original TAM by introducing a second generation of the model, labelled TAM2, to explain how subjective norms and cognitive instrumental processes affected perceived

usefulness and intentions. Undoubtedly, elements of the TAM framework bore relevance towards the experience of the Owner/Manager usage of E-Business within the SME sector, which was considered in Chapter Seven of this thesis.

There has been considerable investigation into the effects of IT/IS on SMEs, triggered by the widespread uptake of usage of the PC in the early 1980s (Chen and Williams, 1993; Pollard and Hayne, 1998). Such studies revealed basic operational and administrative impacts, including; accounting, inventory control, budgeting, spreadsheet analysis and word processing (Raymond and Magnenat-Thalmann, 1982; Farhoomand and Hrycyk, 1985; Malone, 1985; Nickell and Seado, 1986; Kagan and Lau, 1990; Evans and Nesary, 1991; Chen and Williams, 1993; Fuller, 1996; Mitev and Marsh, 1998; Pollard and Hayne, 1998). These studies typically focussed on uptake levels, and problems and benefits accruing from usage (Cragg and King, 1993). Clark (1987), Heikkila et al, (1991) and Pollard and Hayne (1998) asserted that SMEs had limited financial resources to implant IT/IS and a tendency to use PCs as tools for specific tasks (e.g. administration), an ongoing trend identified in several later studies (Bridge and Peel, 1999; Johannessen et al, 1999; Mitchell and Clark, 1999; Lawson et al, 2003). More advanced enterprise use of IT/IS usage have been reported in several studies investigating EDI technologies (Banerjee and Golhar, 1994; Teo et al, 1995; Tuuainen, 1998; Kuan and Chau, 2001). Despite considerable SME investment in IT/IS, especially application software, evidence suggested that there has been minimal efforts to manage its usage within the enterprise, thus lessoning its potential impact (Fink, 1998). Regardless of this, the trend of improved availability of low cost, user friendly and increasingly sophisticated software applications for SMEs has encouraged adoption (DTI, 2004). Current usage levels of E-Business within the context of UK and Wales were considered in Section 3.8.

Several researchers (Blili and Raymond, 1993; Pollard and Hayne, 1998; Fillis et al, 2003) contrasted IT/IS usage between SMEs and larger-sized

enterprises and questioned the need for different managerial approaches. Storey (1997) suggested three key factors where SMEs differed from large sized enterprises, namely: uncertainty, innovation and evolution. Uncertainty, identified where SMEs tended to have a limited customer base and product line in comparison with larger-sized enterprises. Innovation identified where SMEs could adapt and operate within niche markets, with less bureaucracy but had the potential for rapid growth (Scherer, 1988). Burns (2006) however suggested that SME sized enterprises were less likely to undertake research and development related activities than larger organisations due to the cost involved.

The evolution factor identified where SMEs were more likely to evolve and change than the larger-sized enterprises. Pollard and Hayne (1998) asserted that the potential of increased flexibility of the SME structure enables reduced response and decision-making timescales and a greater propensity to change organisational and business focus. Contrastingly, Thong et al, (1996) suggested that SMEs had a tendency to underestimate the time and effort required to implement IT/IS, and were more susceptible to short-term profit-making strategies due to the competitive nature of their business environments. Pollard and Hayne (1998) asserted that the potential of increased flexibility of the typical SME structure enabled reduced response and decision-making timescales and a greater propensity to change organisational and business focus.

Yap et al, (1992), Cragg and King (1993), Iacovou et al, (1995) and Thong and Yap (1995) identified up to five factors that encouraged and facilitated IT/IS growth within the SME sector, which included the critical influence of the Owner/Manager, the external and supporting environments, internal enterprise experiences and resources and benefits to be gained from exploitation. The importance of managerial enthusiasm and buy-in to the process of IT/IS adoption has been recognised (Cragg and King, 1993; Bridge and Peel, 1999). Clear parallels can be drawn with Davis et al, (1989) TAM framework, whereby the end users attitude towards a system was heavily influenced

by perceptions regarding its ease of use and usefulness. Evidence suggested an ongoing trend of increased usage within SMEs contributing to enhanced experience, awareness of and confidence in the IT/IS function (Doukidis et al, 1994). The current SME E-Business usage trends in Wales were explored in Section 3.8 and the benefits of IT/IS exploitation within the following section.

3.2 Benefits of IT/IS Usage for SMEs

Wroe (1987) argued that SMEs were potentially able to exploit IT/IS due to their organisational characteristics of flexibility and speed of transition. If SMEs understand the benefit that IT/IS potentially provided it would encourage increased usage and future adoption (Cragg and King, 1993; Fink, 1998). Blili and Raymond (1993) and Luna and Barcai (1995) identified that SMEs which adopted IT/IS, expected to experience an increase in competitiveness. There has however, been considerable debate and scepticism within academia (Sweeney, 1996; Dhillon, 2005), on the benefits attainable by SMEs from IT/IS usage (Table Six). As identified previously, initial evidence suggested SMEs had largely restricted IT/IS usage to operational and administrative tasks, thereby limiting its potential impact. Ward et al, (1996) noted that few organisations had a complete or comprehensive IT/IS management process to ensure that the proposed benefits from any investments were actually achieved. Emergent evidence however, suggested that this picture was improving (Love et al, 2005).

Table 6: Identified Benefits of IT/IS for SMEs	
Factor	**Author(s)**
Increase in competitiveness	Blili and Raymond, (1993); Luna and Barcai, (1995); Doukidis et al, (1996); Love et al, (2005)
Efficiency gains and reduced costs	Wriston, (1990); Venkatraman, (1994); Fink and Kazahoff, (1997); Fink, (1998); Beheshti, (2004); Kyobe, (2004); Love et al, (2005)
Increased effectiveness of management	Fink and Kazahoff, (1997); Fink, (1998)
Improved speed and responsiveness	Brynjolfsson, (1993); Johannessen et al, (1999)
Initiates flexibility	Wriston, (1990); Venkatraman, (1994)
Improved service quality and customer satisfaction	Berkley and Gupta, (1994); Quinn, (1996); Johannessen et al, (1999)
Improved business performance and productivity	Wriston, (1990); Venkatraman, (1994); Fink and Kazahoff, (1997); Fink, (1998)

Table Six listed the known benefits that SMEs realised through IT/IS usage in prior studies. Fink and Kazahoff (1997) and Love et al, (2005) identified efficiency gains through the automation of manual clerical procedures, increased effectiveness of management through improved decision-making and improved business performance by entering into strategic alliances. Table Six elucidated that SME Owner/Managers recognised IT/IS usage improved speed and responsiveness of business processes, increased service quality and customer satisfaction. Brynjolfsson (1993) noted that individual enterprises experienced the benefits rather than the overall industry.

Therefore, in summation, it could be positively stated that IT/IS usage did offer the opportunity to benefit SMEs, although the level of its impact was influenced by both external and internal factors, such as the degree of implementation and strategic alignment of IT/IS with business objectives (Chan et al, 1997). Thus, the level of implementation of IT/IS could be impaired by the ability of the enterprise to overcome inhibitors to usage, which was considered within the next section. Moreover, it was important to understand the IT/IS benefit attained from IT/IS utilisation at each SME size classification, which was considered in the primary research presented within Chapters Four and Five of this thesis. This

research informed the response to the research Objectives One and Two identified in Section 1.0.

3.3 The Problems and Inhibitors to IT/IS Usage within SMEs

Whilst the use of IT/IS has been recognised as an opportunity to improve the effectiveness of enterprises (Section 3.2), several barriers to effective deployment and usage were identified. MacGregor and Vrazalic (2005) determined that these inhibitors limited the expansion and growth opportunities of SMEs. Moreover, Clegg et al, (1997) identified that up to 90% of IT/IS investments did not meet their performance objectives, while Sweeney (1996) argued that IT/IS has failed to deliver the results despite the hype. Further to this argument, Dhillon (2005) identified that in the US nearly $59 million was being spent on IT/IS cost overruns and $81 million in cancelled projects. A number of studies, including Morrison and Berndt (1990), Brynjolfsson (1993), Dos Santos et al, (1993), Loveman (1994) and Powell and Dent-Micallef (1997), provided further evidence of wasteful investment and unsuccessful IT/IS deployment.

The most prevalent of these inhibitors to success, within individual studies, have been identified as: -

- limited financial resources (Blili and Raymond, 1993; Cragg and King, 1993; Fink, 1998; Anckar and Walden, 2001; Barry and Milner, 2002)
- insufficient time (Malone, 1985; Cragg and King, 1993; Cragg and Zinatelli, 1995)
- limited IT/IS knowledge and skills and training (Blili and Raymond, 1993; Cragg and King, 1993; Doukidis et al, 1996; Palvia and Palvia, 1999; Anckar and Walden, 2001; Barry and Milner, 2002; Kyobe 2004)
- limited dedicated IT personnel (Chang and Powell, 1998; Fink, 1998; Kyobe 2004)

- technical problems (Cragg and King, 1993; Thong, 2001; Kyobe 2004)
- resistance to change (Anckar and Walden, 2001).

Indeed, Binks and Ennew (1996) cited restricted access to finance as a significant constraint on SME growth. Such inhibitors invoked reservations regarding the adoption and utilisation of IT/IS within SME Owner/Managers (Daniel, 2003). The negative influence of these factors affected the ability of the enterprise to exploit and adopt E-Business, and can be regarded as an extension of IT/IS usage. Thus, it was apparent the occurrence of IT/IS, and thereafter E-Business inhibitors to SMEs utilisation, was significant and must be considered in the context of this research study to examine their relevance in the context of Wales.

In addition, further evidence was required to determine the significance of such inhibitors, within different SME size classifications, to discern whether the SME enterprise experience was consistent. Investigation of such issues informed the study providing key evidence towards the fulfilment of research objectives one and two identified in Section 1.0. A key determinant to successful deployment of IT/IS remained the degree of strategic deployment within the SME sector, which was considered within the following section.

3.4 Planning the IT/IS Function

Storey (1994) identified business strategy as one of the three components that contributed towards growth in SMEs, the other two being entrepreneurial characteristics and intent. Fuller (1996) and Pollard and Hayne (1998) found that IT/IS usage within an organisation, provided the opportunity to gain sustainable competitive advantage through increased organisational efficiency, effectiveness and as an enabler of enterprise growth. If, however, the key decision makers within an enterprise were unaware of the potential benefits that IT/IS exploitation offered, then the

opportunity could be missed (Farbey et al, 1993; Doukidis et al, 1996; Ballentine et al, 1998).

Evidence indicated that SMEs must develop a long-term planning framework and fully integrate IT/IS within enterprise planning (Lederer and Sethi, 1988; Galliers, 1991), to achieve an increase in competitiveness (Blili and Raymond, 1993). However, Cragg and King (1993), Hagmann and McCahon (1993), Ballentine et al, (1998), Fink (1998) and Bridge and Peel (1999) found that few SMEs plan their IT/IS development, a contributing factor being that most invest in technology incrementally based on immediate operational requirements (Hashmi and Cuddy, 1990). Indeed, Bridge and Peel (1999) reported that IT/IS strategic planning was undertaken in only 23% of SMEs, whilst Hagmann and McCahon (1993) identified 30%, a trend mirrored in other studies (Lees and Lees, 1987; Le Rovere, 1996).

Furthermore, this trend of limited strategic planning was apparent in recent E-Business surveys, including DTI (2004), Kyobe (2004) and eCIC (2005) (Section 3.8). The public sector was also deficient in providing a clear planning strategy for IT/IS development (Anderson and Nicolajsen, 2001). Fink (1998) and Ferneley and Bell (2005) determined that decision making in the SME, was typically, a short-term reaction to immediate pressures and was reliant on intuition and instinct, thus implementing IT/IS in a fragmented, cost-driven manner, as opposed to an anticipation of future events. Naylor and Williams (1994) found that SMEs, where IT/IS was fully utilised, were more successful than those which did not, whilst Cragg and Zinatelli (1995) identified that usage was becoming more sophisticated.

Levy et al, (1999) stressed the importance of IT/IS planning strategies within SMEs. Levy and Powell, (2000) and Ferneley and Bell, (2005) identified that an IT/IS strategy approach should reflect the role of information as a strategic resource. Levy and Powell (2000) posited that IT/IS strategy recommendations in SMEs, needed to take account of

organisational change issues. Premkumar and King (1994) argued that enterprise decision makers should reflect on the role of IT/IS and adjust their planning processes to match. Chan et al, (1997) identified a positive relationship between IT/IS alignment and organisational performance, while Bergeron and Raymond (1992) concluded that IT/IS should be used as a strategic weapon by SME decision makers, to maintain their competitiveness and attain a positive position within their area of activity. The role of the Owner/Manager of the SME should be regarded as critical within this process, as they represented the key decision maker in the development and usage of the IT/IS function (Fink, 1998).

The degree of effectiveness of SMEs' IT/IS function was largely controlled by its strategic management, development and control (Blili and Raymond, 1993). The level of IT/IS planning within SMEs had a direct influence on utilisation and development of E-Business within SMEs (Ferneley and Bell, 2005). King et al, (2000) explored the alignment between business and IT/IS planning, and recognised the need to further research this factor within SMEs, especially within the context of E-Business. Therefore, it was important to extend this research to identify the degree of planning of the E-Business function within SMEs in Wales, which was considered within the first research aim of this study.

In this section, the importance of IT/IS planning being aligned with business objectives, was identified as a key success factor to successful adoption and utilisation within the SME. The increased interest in IT/IS usage within the SME sector was driven by its increased accessibility due to reduced cost, usage and adoption by competitors and its potential to increase enterprise effectiveness and competitiveness (Lin et al, 1993). The degree of IT/IS planning had implications for the effective utilisation of E-Business within SMEs and was investigated in the context of Welsh SMEs in the following sections, thus providing evidence towards the fulfilment of the first research objective, namely an assessment and

evaluation of the key factors underpinning E-Business usage. The development of E-Business and its increased affordability, has presented SMEs with the opportunity to enter and exploit new markets. Therefore, it was important to investigate the development and growth of the Internet, which underpinned E-Business usage, which was considered in the following section.

3.5 The Internet and SMEs: its Benefits and Inhibitors

This section considered the emergence of the Internet and the key issues which determined adoption namely its benefits and inhibitors to usage (Houghton and Winklhofer, 2002; Pflughoeft et al, 2003). Gibbs et al, (2003) recognised the benefits of Internet usage as enablers to further E-Business utilisation, whilst inhibitors were defined as barriers, which potentially restricted further growth of IT/IS. Venkatraman (1991) identified that IT/IS had the potential to revolutionise businesses through E-Commerce and E-Business technologies. Sterrett and Shah (1998) and Stockdale and Standing (2004) argued that micro-sized enterprises could compete with larger-sized enterprises by using the Internet as their size enabled them to be more adaptable and responsive to changing conditions. For effective E-Business utilisation within an enterprise, it was recognised that there was a need to integrate strategy, structure and systems with people and processes, (Lederer and Sethi, 1988; Blili and Raymond, 1993).

As identified within Section 3.3 the adoption of E-Business in SMEs, as with IT/IS, was generally reactive rather than proactive (Levy et al, 1997). SMEs were often driven by perceived pressure from customers, competitors and peers to develop E-Business capabilities (Riemenschneider et al, 2002). Hagmann and McCahon (1993), Poon and Swatman (1999a) and Drew (2003), pertinently concluded that SMEs remained cautious about investing in advanced E-Business technologies. This could reflect a prior legacy of unfulfilled or unsuccessful IT/IS adoption as identified in the previous section. Quayle (2002) noted that

even those SMEs which had embraced E-Business had no real strategy in place and had not experienced a meaningful return on investment. Moreover, the inability of SMEs to quantify the benefits accrued by their IT/IS investment, suggested a lack of evaluation and in-depth understanding of the technology. Thus, the Owner/Manager motivations underpinning IT/IS investment decisions were typically an uninformed belief regarding business potential. Seemingly, SMEs were driven to invest by necessity, with cost their main consideration and ongoing business sustainability also a key concern (Levy and Powell, 1999).

The Internet has been portrayed as a major change mechanism for the 21st century (Levy and Powell, 1999) with the potential to affect competitiveness, reshape business relationships and restructure industry practices (Fariselli et al, 1999; Daniel and Grimshaw, 2002; Feindt et al, 2002). Lee (2001) noticed that the utilisation of E-Business was no longer an alternative, but imperative for enterprises to remain competitive. Developments in the field of IT/IS, computer networks and improved telecommunications infrastructure, had increased the uptake of E-Business (Bhatt and Emdad, 2001). Levy et al, (1998), Turban et al, (2000) and Al-Qirim and Corbitt (2001), commented that few innovations in human history offered as many potential benefits as E-Business, and the Internet was becoming an essential tool for assisting SMEs in overcoming organisational deficiencies. Barry and Milner (2002) identified that the Internet offered opportunity both to the SME and to the individual customer.

Ng et al, (1998), Chappell and Feindt (1999), Poon and Swatman (1999b), Dedhia (2001), Mehta and Shah (2001), Daniel and Wilson (2002) and Quayle (2002), suggested that there were many advantages to be gained from SMEs undertaking business through the Internet, especially in terms of perceived operational and financial benefits that could be attained. The advantages identified with E-Business usage were an extension to benefits attainable with IT/IS usage (Section 3.2). Enterprises were no longer restricted by geographical locations and could

compete in new national and global markets, both for customers and suppliers, through the Internet (Damanpour, 2001; Mehta and Shah, 2001; Tetteh and Burn, 2001; Tiessen et al, 2001; Barry and Milner, 2002; Brunn et al, 2002; Chau and Turner, 2002; Anckar, 2003; Dholakia and Kshetri, 2004). Such hyperbole must be treated with caution, as innovations have a tendency to be met with a wave of hysteria and over optimism in terms of their potential impact on their industry. An example would be the media and business community over reaction to the impact of E-Commerce on the business community (Hayes and Finnegan, 2005).

The Internet has provided increased accessibility and convenience to potential customers with 365 days a year, 24 hours a day, seven days a week availability (Lin and Hsieh, 2000; Anckar, 2003; Raisinghani et al, 2005). Thus, in theory, the SME sector can use the Internet as a new marketplace to compete against larger-sized enterprises (Hsieh and Lin, 1998; Timmers, 1999; Lane and Stolting, 2005). Furthermore, the opportunity to exploit these new markets through E-Commerce trading would be at a fraction of the cost of using traditional methods to access new markets and potentially increase revenue (Poon and Swatman, 1997a; Currie, 1998). Chaston et al, (2002) found that SME accountancy firms, who were exploiting the Internet, were more proactive with the provision of services. Consequently, they had the opportunity to gain competitive advantage by enhancing their service provision, thereby achieving higher sales growth rate. At present, there was limited evidence to suggest that Hsieh and Lin, (1998), Timmers, (1999), Lane and Stolting, (2005) were correct in their assertion that E-Business enabled SMEs to compete equally with larger-sized enterprises. Further evidence regarding the effectiveness of E-Business performance in the SME community was required which was provided within the conclusions of this thesis to make a contribution to the body of knowledge.

Poon and Swatman, (1999b) and Barry and Milner, (2002) suggested that the Internet enabled SMEs to undertake several core activities with increased efficiency and effectiveness, including reducing timescales (Ancker, 2003) and cost (Hsieh and Lin, 1998; Doherty et al, 1999), due to improved electronic communication links between enterprises through E-mail and websites (Duchessi et al, 1993; Fuller and Jenkins, 1995; Deighton, 1997; Hamill and Gregory, 1997; Dutta and Evrard, 1999; Danbridge and Levenburg, 2000; Sadowski et al, 2002; Kaynak et al, 2005). E-mail provided the SME with a more efficient communication media in comparison to the traditional methods such as telephone and postal mail (Lohrke et al, 2006). E-mail enabled the potential transfer of multi media electronic messages with the transfer of document attachments (Daniel et al, 2001). Strauss and Hill (2001) noted that E-mail enabled enterprises to provide effective customer support after sales.

Similarly Lohrke et al, (2006) suggested that websites provided a mechanism to maintain permanent and ongoing contact resources for customers. Such activities included the use of the website to advertise products, receive payments and products/service attributes (Liu et al, 1997; Griffith and Krampf, 1998; Daniel and Wilson, 2002). Sadowski et al (2002) and Santarelli and D'Altri (2003) have acknowledged that SME Owner/Managers regarded communicating with customers through E-mail and websites as a significant benefit of their E-Business provision. E-Business exploitation also enabled the opportunity to reduce costs through decreased advertising, design and manufacturing costs, savings in communication and delivery expenditure, notably for goods that could be directly delivered (e.g. digital music) (Poon and Swatman, 1997b; Timmers, 1998). Poon and Jevons, (1997) discovered that the Internet provided SMEs with an unprecedented opportunity to engage in international marketing campaigns via a website (Kaynak et al, 2005). Such evidence suggested that Internet usage could have a beneficial impact upon the effectiveness of business operations. Further evidence was required to investigate the impact within the SME

community, particularly the micro-sized enterprises which was provided within Chapter Seven.

Barry and Milner (2002) suggested that the Internet enabled the possibility of mass and individual consumer customisation. Furthermore, the Internet provided a new channel for promotional, marketing and advertising activities (Currie, 1998; Hsieh and Lin, 1998; Nath et al, 1998; Poon and Swatman, 1999b; Timmers, 1999). E-mail and document sharing allowed SMEs to improve and increase communication with staff, suppliers and customers (Currie, 1998; Doherty et al, 1999; Tumolo, 2001; Piris et al, 2004). Moreover, E-Business increased selling power by shortening procurement cycles with online catalogues, ordering and payment systems (Currie, 2000). E-Commerce offered low cost barriers to entry and regarded as a perceived image enhancer to the enterprise (Nath et al, 1998). Currie (1998) suggested that the Internet provided the ability to cut costs on both stock and manufactured goods through competitive bidding. The current applicability of such opportunities for the SME community was questionable given the lack of current evidence. As the adoption of more sophisticated technologies becomes more commonplace however, SMEs will undoubtedly look to exploit such opportunities. Further research was required within the academic press to record the success of such activity.

Potentially, E-Business offered the opportunity for the traditional storefront SME to initiate a transition to become a virtual enterprise, where all business was undertaken through the Internet thus permanently changing the business model (e.g. http://www.amazon.com) (Poon and Swatman, 1999a; Enders and Jelassi, 2000; Kehoe and Boughton, 2001). Within this process, stages within the value chain were removed (e.g. manufacturer sells direct to consumer without a need for retailer), a process known as disintermediation (Jelassi and Leenan, 2003; Fillis et al, 2004; Harrison and Waite, 2005). Examples of disintermediation included enterprises such as online travel agents (e.g.

http://www.expedia.co.uk) and bookshops (e.g. http://www.amazon.co.uk) which dealt directly with the customer, without the need for a traditional shopping experience (Zerdick et al, 2000). Re-intermediation referred to the way in which buyers and sellers were connected to the marketplace, a pertinent example being airlines (e.g. http://www.easyjet.com), enabled direct flight bookings through a website, instead of through a traditional travel agent.

The likelihood of E-Business success would be determined by the nature of the business sector and the products and services provided. The reality for SMEs, especially the micro-sized classifications, was questionable and could be a transitional model, whereby E-Business was utilised to supplement and enhance existing business practice. Moreover, the Internet provided further opportunities for networking through online communities. Examples of this phenomena would be websites such as Wikipedia® (http://www.wikipedia.org/) a free online encyclopaedia updated and maintained by its users containing 250 million words and 360,000 entries (Waldman, 2004) and Friends Reunited (www. http://www.friendsreunited.co.uk) a school and college reunion website now worth £120 million (Gerard, 2005). The Internet provided the opportunity to establish effective inter-business collaborations to reduce development cycles and accelerate time to market (Currie, 1998; Barnes et al, 2004). Furthermore, the Internet provided technology that enabled businesses to retrieve considerable amounts of information on a multitude of subjects, including market intelligence on competitors (Abell and Lim, 1996; Currie, 1998; Jeffcoate et al, 2004; Quayle and Christiansen, 2004). Such knowledge was a valuable resource, potentially adding value to the enterprise (Baker, 1994).

The Internet provides up to the minute information for consumers, latest prices, offers (e.g. http://www.lastminute.com), product and service availability (Ancker, 2003). An SME's ability to manage organisation knowledge was increasingly important for commercial success (Baker, 1994; Poon and Swatman, 1995). In terms of the customer, the Internet

provided several benefits including global choice, increased quality of service, potential of personalised/customised products and services with increased consumer involvement, rapid response to needs, increased product and service innovation, cost savings and new products and services (Currie, 1998; Barry and Milner, 2002; Brousseau and Chaves, 2005). The increased geographical reach enabled customers to purchase products from enterprises with which it would otherwise be impractical to trade (Baker, 1994; Poon and Swatman, 1997a). Thus, in summary, business use of the Internet offered many potential benefits for the SME community. The realisation of such benefits was questionable within the SME community and further evidence was required to ascertain the reality.

Recent research (Karakostas et al, 2005) has advocated the use of specialist Customer Relationship Management (CRM) software within the SME sector. A report predicted that CRM spending by SMEs would reach $2 billion globally, of which Europe, the Middle East and Africa would account for $600 million of the total ahead of North America (Printing World, 2005). CRM emerged due to the evolution of web technology and marketing science and offered the potential of enabling strategic advantage over competitors (Sin et al, 2005; Nguyen et al, 2007). Ahn et al, (2003) noted CRM involved the acquisition, analysis, management and exploitation of knowledge, regarding customers, with the aim of effectively achieving higher sales. CRM software provided multiple benefits in managing and automating customer interaction, service and support and marketing (Baumiester, 2002). Such interaction enabled a personalised relationship with the customer. In addition, CRM analysed the behaviour of the customer through data mining and reporting tools. This provided invaluable measures of customer satisfaction and retention and enhanced the understanding of customer problems and preferences (Pan and Lee, 2003). Such information would provide strategic data that would inform marketing and sales strategy (Srivihok and Batanov, 2005).

It was questionable, however, whether the SME sector, particularly the micro-sized classifications, had the IT/IS infrastructure and knowledge to implement such systems, or the financial investment required when you consider that Microsoft's system currently costs at least £10,000 to introduce (Baumiester, 2002; Bharati and Chaudury, 2006). CRM technology was currently more relevant for enterprises with a large customer base, a facet most micro-sized SMEs were unlikely to possess (Srivihok and Batanov, 2005). In micro-sized enterprises, ad hoc CRM systems were typically deployed through use of spreadsheets and databases (Harrigan et al, 2007). In addition, high implementation cost was likely to deter the vast majority of SMEs. The SME community was only likely to change its attitude to sophisticated CRM implementation with increased affordability, usability and availability. With such a scenario, parallels could be made with Davis' (1989) TAM framework, whereby widespread acceptance of CRM would only occur if Owner/Managers accepted the perceived usefulness and ease of use of the technology.

Several inhibitors to Internet usage in SMEs were identified, which Debreceny et al, (2002) described as the forces that moderated E-Business adoption by enterprises. Such inhibitors delayed and even stopped an enterprise's adoption of E-Business technology. Nambisan and Wang (1999), Stockdale and Standing (2004) and MacGregor and Vrazalic (2005) noted that these barriers remained prevalent. Several of these barriers were associated with the nature of the experience itself and related to commerce on the Internet (Liebermann and Stashevsky, 2002; Anckar, 2003). These included concerns regarding the attributes of personal service, delivery times, lack of enjoyment associated with online shopping (Phau and Poon, 2000), difficulty in use (Anckar, 2003) and transactional security (Ibbotson and Fahey, 2004; Taylor and Murphy, 2004).

Other inhibitors concerned the impact on the business operation itself; included within this classification were: -

- the cost of connection charges (Anckar, 2003)
- the reliability/lack of IT/IS infrastructure (Auger and Gallaugher, 1997; Walczuch et al, 2000; Anckar, 2003; Fillis et al, 2004)
- limited Internet usage by customers and suppliers (Hadjimanolis, 1999)
- the cost of IT/IS equipment and ongoing maintenance (Chappell and Feindt, 1999; Van Akkeren and Cavaye, 1999; Elsammani et al, 2001; Darch and Lucas, 2002; Quayle, 2002; Hollenstein and Wörter, 2004; Ibbotson and Fahey, 2004)
- IT/IS skills competencies and experience of business (Teo et al, 1998; Boyes et al, 2002; Darch and Lucas, 2002; Duan et al, 2002; Quayle, 2002; Riquelme, 2002; Anckar, 2003; Hughes et al, 2003; Lawson et al, 2003; Barnes et al, 2004)
- concerns regarding security (Abell and Lim, 1996; Rowley, 1998; Furnell and Karweni, 1999; Keeling et al, 2000; Riquelme, 2002).

Other inhibitors were identified as E-Business resistance to change, including a lack of awareness and satisfaction with existing business practices (Lawrence, 1997; Poon and Swatman, 1999a; Venkatesan and Fink, 2002; Simpson and Docherty, 2004). Ndubisi and Jantan (2003) noted that the presence of enterprise IT/IS skills and technical support has a strong influence on determining the level of eventual deployment. If they were prevalent, then usage of IT/IS would be sustained and enhanced, which related to the TAM model of perceived usefulness and ease of use. By contrast if IT/IS skills and technical support were not prevalent, then the reverse scenario applied, with Owner/Managers not considering E-Business a worthwhile implementation, due to the perceived difficulty of adoption and its limited potential to improved operation effectiveness and profitability.

A number of the inhibitors within the enterprise were seemingly related and inter-dependent. For example, commonly cited problems within SMEs were the inability to achieve growth due to lack of finance (Owens and Beynon-Davies, 2001; Wymer and Regan, 2005), skills and time (Simpson and Docherty, 2004; Davies et al, 2005; MacGregor and Vrazalic, 2005; Ritchie and Brindley, 2005). Limited finance could affect a number of the inhibitors identified above; including cost of initial IT/IS equipment, training provision and connection issues. The significance of such factors would potentially change over time, with technological advancement, increased IT/IS availability and usage and Owner/Manager familiarity. As before, linkages were apparent with Davis' (1989) TAM model discussed in Section 3.1 in terms of how technological uptake could be influenced by perceptions regarding its value. Moreover, E-Business inhibitors were related to the IT/IS barriers noted within Section 3.3 of this chapter. Indeed, it could be argued that the Internet-related inhibitors were in addition to, and an extension of, existing IT/IS-related barriers. Therefore, the impact of the Internet related inhibitors might be influenced by the SMEs ability to firstly manage, and thereafter overcome detrimental effects of the initial IT/IS inhibitors.

This section has considered the impact of the Internet on the SME, and its benefits and inhibitors to usage, according to an established body of literature. Overall, it was apparent that there were significant barriers to E-Business usage, which derived from both the Internet and IT/IS deployment, although these were counter balanced by the significant advantages of effective E-Business deployment (Lewis and Cockrill, 2002). However, it was recognised that there was limited research focusing on the implementation of E-Business within the SME sector (Chen et al, 2003; Jones and Mohon, 2005; Fink and Disterer, 2006). Indeed, Raymond (2001) suggested that the criteria driving SMEs to adopt the Internet and its uses remained important research questions. Therefore, there was a need to assess the influence of E-Business such inhibitors and benefits within the context of the impact upon SMEs

various size classifications, which provided evidence towards the second research aim of this thesis identified in Section 1.0.

3.6 E-Business and SMEs

In recent years, an emergent body of literature appraising E-Business and the SME has appeared with several central themes, namely: -

- the benefits of adoption (Doherty et al, 1999; Poon and Swatman, 1999a; Tse and Soufani, 2003), growth of usage within the SME community (Quelch and Klein, 1996; Hamill and Gregory, 1997; White et al, 1998)
- barriers to growth (Riemenschneider and McKinney, 1999; Blackburn and Athayde, 2000; Thong, 2001)
- models of development and their criticisms (Poon and Swatman, 1999b; Daniel, 2003)
- the development of business competencies (Tetteh and Burn, 2001; Ramsey et al, 2003), entrepreneurial behaviour (Chaston et al, 2002)
- attainment of competitive advantage through E-Business utilisation (Weiber and Kollmann, 1998; O'Donnell et al, 2002).

Within enterprises where E-Business has become the central focus, IT/IS was used to support business goals and objectives, as a reaction to customers and other competitive forces (Gale and Abraham, 2005). During the late 1990s, there was a great deal of hysteria surrounding the likely success of E-Commerce and a number of Internet based businesses were created and collectively described within the media as 'dotcoms' (Hayes and Finnegan, 2005). Unrealistic trading aspirations and overpriced stock shares, led to the failure of many such enterprises (e.g. Boo.com, eToys.com and ClickMango.com) (Nataraj and Lee, 2002; Barnes et al, 2004; Karagozoglu and Lindell, 2004; Hayes and Finnegan, 2005). In recent years, successful dotcoms have emerged (Bernadas and Verville, 2005), such as http://www.amazon.co.uk and http://www.friendreunited.com, which have, reinvented existing business

models and enhanced trading practices (Drew, 2003). Schlenker and Crocker (2003) reported examples of E-Business success remained limited, especially within SMEs, and it was apparent that the sector had much to learn.

Mehrtens et al, (2001) identified three key drivers of decisions within SMEs to invest in E-Business as, perceived benefits (Poon and Swatman, 1999a), organisational readiness and external pressures (Ibbotson and Fahey, 2004). The ability of the SME Owner/Manager to recognise and understand the benefits and relevance of E-Business utilisation was an obvious driver towards usage and increased uptake (Poon and Swatman, 1999a; Poon, 2000; Hughes et al, 2003; Bharati and Chaudhury, 2006). Lau and Voon (2004) suggested that successful E-Business adopters were highly motivated and entrepreneurial in nature with an ability to accept risk. Fillis et al (2004) found that longer-term, expected benefits drive E-Business utilisation, as opposed to shorter-term gains. Organisational readiness was dependant on the personality of the Owner/Manager and existing IT/IS infrastructure. Beckinsale and Levy (2004) suggested that the more entrepreneurial and risk-taking the Owner/Manager, the greater the likelihood that they will adopt E-Business practices.

The adequacy of the SMEs' IT/IS infrastructures had immediate implications on their suitability for E-Business adoption and potentially impaired core business activity (Poon and Swatman, 1999b). Customers, suppliers and even employees (Keeling et al, 2000; Poon 2000; Beckinsale and Levy, 2004) exerted external pressure. Indeed, a lack of customer use must be regarded as an inhibitor (Sillence et al, 1998). Kendall et al, (2001) identified that existing knowledge of the owner and the relative advantages from E-Business, drives adoption. Beckinsale and Levy (2004) and Simpson and Docherty (2004), determined that overall perceived benefit was the most significant driver for Internet adoption, with external pressures and organisational readiness important issues. Similarly, Kandelin et al, (1998), Jeffcoate et al, (2002) and Rodgers et al, (2002) identified critical success factors for successful E-

Business implementation as participation with IT/IS, top management support, commitment, control and planning structures, process improvement, effective integration, enterprise culture and training.

Evidence suggested that successful adoption of E-Business varied according to, the size of the enterprise, exporting activity, and awareness of benefits, sector, customers and influence of trading partners (Poon and Swatman, 1999a; Poon, 2000; Doherty et al, 2001; Sadowski et al, 2002). Research suggested that customer participation in E-Business was critical to success, as was the nature of the business environment (Poon, 2000) and effective security (Furnell and Karweni, 1999). In general, these studies demonstrated that enterprises benefited from E-Business (Daniel and Grimshaw, 2002), but specific conditions must be met to achieve any gain. Significantly, Hodson and Whitelock (2003), differentiated between SMEs that operated as lifestyle businesses and entrepreneurial ventures which actively pursued growth. Thus, it seemed that the attitude of the Owner/Manager was a critical variable in deciding the competitive position of the enterprise. The role and importance of the Owner/Manager in the effective use of E-Business was further considered in later chapters and provided further evidence towards the fulfilment of the first research aim stated in Section 1.0.

Fillis and Wagner (2005) concluded that some SMEs were only prepared to grow to a certain size, due to lifestyle influences and consequently their rate of E-Business adoption varied significantly. The lifestyle business identified that they might adopt a particular level of E-Business attainment, but would not actively pursue growth as a business objective. Moreover, they noted the complex variables and relationships within an SME meant that investment decisions, such as IT/IS, were not made in isolation. Such a view was supported by Drew (2003), who noted sectoral differences could result in different internal requirements for SMEs, in relation to strategy development, training and support. However, there may be major opportunities for entrepreneurial SMEs, as E-Business and E-Commerce sophistication has improved and there were

undoubtedly many examples of lifestyle enterprises that have successfully adopted E-Business. Further to this discussion, Jones et al (2003a) queried the difference between the adoption of the Internet and actual enterprise growth. For example, a large number of traditional SMEs utilised E-mail and the Internet, but had no intention of undertaking transactional E-Commerce (Simpson and Docherty, 2004). Such enterprises might pursue business growth, but not E-Business development and vice versa. Therefore, the relationships and inter-relationships between business and E-Business usage require clarification. Raymond (2001) and Downie (2003) noted the need for further research examining E-Business impact on the various SME size classifications.

Whilst success in adoption had been reported in larger organisations (Van Beveren and Thomson, 2002), doubt has been expressed about the ability of SMEs, particularly micro-sized classifications, to successfully exploit E-Business, given their limited access to in-house expertise and resources (Auger and Gallaugher, 1997; Blackburn and Athayde, 2000; Kleindl, 2000; Anckar and Walden, 2001; Bode and Burn, 2001; Boyes and Irani, 2002; Beckinsale and Levy, 2004; Chong, 2004). Quayle (2002) identified that E-Business was not considered important by many UK SMEs, with only a third actually undertaking electronic trading. Furthermore, Levy et al, (2004) recounted only around half the SMEs they surveyed believed that E-Business was important or essential. Barry and Milner (2002), Barnes et al, (2004) and MacGregor and Vrazalic (2005) suggested that SME Owner/Managers were not enthusiastic or proficient about adopting Internet technologies and their advanced usage remained low (Goode, 2002).

Brown and Lockett (2001) and Van Beveren and Thomson (2002) found that where adoption had occurred, failure rates were high. For example, Nataraj and Lee (2002), recounted that the failure rate among SMEs in the USA undertaking E-Business activities was in excess of 75% within two years of business start-up, which equated to 15,000 job losses. The

prime reason for this failure was cited by Paper et al, (2003), Quayle (2003) and Raymond et al, (2005) as a lack of a strategic model for E-Business implementation. McBride (1997), Barry and Milner (2002) and Taylor and Murphy (2004) supported this viewpoint arguing that enterprises were adopting E-Business related technologies, not as a product of reasoned planning strategy, but as victims of competitive pressures and media hype. Rodgers et al, (2002) argued that micro-sized enterprises could not compete with larger organisations without an E-Business strategy. However, the evidence presented in this section suggested that the planning of the E-Business function within SMEs was deficient, although more research was required to explore this facet across the various SME size classifications (Drew, 2003).

Webb and Sayer (1998) found that 83% of SMEs in NI did not have an E-Business planning strategy, nor had they considered the Internet within their marketing strategy. Similarly, Hughes et al, (2003) noted that only 76% of SMEs actually undertaking E-Business activities had a formal strategy plan. SMEs with a planning strategy, reported a positive impact on their E-Business operation (Jelassi and Leenen, 2003). As noted within Section 3.3, SME Owner/Managers lacked proficiency in IT/IS planning and had low future expectations of what could be achieved (Poon and Swatman, 1999b). The evidence suggested that this trend has continued with E-Business usage and adoption and SMEs were still categorised as laggards (Dans, 2001).

The Owner/Manager attitudes towards E-Business usage can be largely attributed to their perceptions, knowledge and understanding of the media (Grandon and Pearson, 2004). Danbridge and Levenburg (2000), Daniel and Wilson, (2002); Ndubisi and Jantan (2003) noted that enterprises, which have favourable perceptions towards the usefulness of their E-Business function, made more effective use of technology than those with unfavourable attitudes. Beckinsale and Levy (2004) identified that SMEs' Owner/Managers did not view the Internet as key to their business strategy, whilst Daniel and Grimshaw (2002) found the adoption

of E-Business within the enterprise, required consideration of a formal and appropriate E-Business strategy (Chaffey, 2002), enterprise culture (Boddy et al, 2002; Coates, 2001) and potentially restructuring (Gulati and Garino, 2001). Thus, SMEs' Owner/Managers were reluctant to make the necessary time and financial commitment to E-Business development, without clear indications of immediate benefit and were not prepared to undertake the change process (Lockett and Brown, 2000). Daniel and Grimshaw (2002), Lee et al, (2002) and Lesjak and Vehovar (2005) recognised that the use of E-Business contributed to the creation of considerable current and future economic benefits, which reflected in increased market value of businesses. Lewis and Cockrill (2002) identified that 71% of enterprises surveyed, which comprised 25 SMEs with fewer than 60 employees, realised quality benefits in terms of reduced costs, increased efficiency and customer base.

Poon and Joseph (2001) reported E-Business benefits as increased competitiveness and improved business performance. Poon (2000) determined that only enterprises that had been online for two years identified benefit to the business, whilst Poon and Swatman (1999b) found that enterprises Owner/Managers continued their E-Business operation based on potential future benefits rather than immediate returns. In terms of key success factors, Grimshaw et al, (2000) and Daniel (2003) identified that integration of E-Business services with internal IT/IS existing legacy systems, was an important determinant of eventual effectiveness. Whilst Poon (2000) reported successful SME E-Business utilisation must focus on the business environment, including relationships with suppliers, customers, business partners and competitors, to attain success and potential competitive advantage. Furthermore, Poon (2000) and Croll et al, (2001) observed the importance of knowing E-Business benefits and customer participation.

Lee (2001) identified the change process as a potentially disruptive innovation, which could radically change the nature of business operations. In addition, there was a lack of understanding regarding the

opportunities provided by E-Business as a mechanism of change to increase organisational competitiveness. Conversely, there has been increased general usage of E-Business within the SME community (DTI, 2004; eCIC, 2005). However, this has been driven by the emergence and general usage of E-mail and the Internet as a personal/business tool and the increased affordability and availability of IT/IS. Thus, SMEs' Owner/Managers seemed to be adopting a basic level of E-Business, through utilisation of the Internet and E-mail, but do not have the organisational resources, capacity or apparent desire to enhance their technological proficiency. Thus, the evidence suggested SMEs use of E-Business remained embryonic with the majority not participating in sophisticated, interactive E-Business solutions (Lewis and Cockrill, 2002). Furthermore, the development and uptake of E-Business was uncoordinated and ad hoc (eCIC, 2005). This presented an interesting argument in terms of the SME community and its uptake of E-Business. The question arose, was the reality of uptake based on a sustainability model, where enterprises selected known, low cost, readily available and accessible technologies such as PCs using application software, Internet access and E-mail communication?

Within such an approach, E-Business growth was not pursued but gradually attained as per immediate operational requirements E-Business technologies were used to support, as opposed to revolutionalise, existing business practices (Lee, 2001). The SME Owner/Manager were seen to be reluctant to undertake the responsibility for technological change (Kalakota and Robinson, 2000). This was supported by Piris et al, (2004), who identified that E-Business operations were becoming a competitive necessity in certain industry sectors, which were highly competitive. Alternatively, several examples of highly innovative SMEs that were prepared to adopt higher levels of E-Business technologies (Loebbecke and Schäfer, 2001), and thereby potentially change the nature of their business operations were apparent. It was apparent that there was a need for further research within the SME population to investigate the reality of this phenomenon.

As a consequence, Schneider and Perry (2001), Lockett and Brown (2003b), Gibbs and Kraemer (2004) and Galloway and Mochrie (2005) suggested SMEs' Owner/Managers required significant support from government and support agencies to enable this transition. Blackburn and Athayde (2000) recommended three strategies to assist the SME sector in developing E-Business aptitude awareness raising initiatives (Iacovou et al, 1995), the provision of training to enhance IT/IS skills (Pollard and Hayne, 1998) and utilisation of consulting services to assist transfer of business practices to the Internet (Zalud, 1999). Additionally, Gibbs and Kraemer (2004) identified providing a positive legal environment and specific incentives to encourage E-Business adoption. Pavic et al, (2004) suggested that governments needed to take a long-term view, with the provision of extensive telecommunications networks and a proactive regulatory framework. In Korea, however, where the government had been supportive of E-Business development within SMEs, there was minimal evidence to suggest that these policies have been successful in changing attitudes (Nugent and Yhee, 2002).

A critical issue in effective E-Business usage was to convince reluctant Owner/Managers to receive and accept external advice (Hankinson, 2000; Stockdale and Standing, 2004). In Europe, considerable efforts have been made by governmental agencies to accelerate E-Business adoption amongst SMEs (eEurope Action Plan, 2002; OECD, 2002; OECD, 2004; Business Link, 2005), in the belief that it would encourage future business success (Beaver, 2002). Matlay (1999) however, queried the success of such projects to promote the effectiveness of government training in support of SMEs. Often these projects were undermined by limited aspirations, timescales, budgets and overlap (Matlay, 1999). MacGregor and Vrazalic (2005) stated that funding should be explicitly targeted towards potential E-Business adapters, management and employees in the form of technical expertise, training provision and financial assistance (Palvia and Palvia, 1999; Ritchie and Brindley, 2005).

The emergence of application service providers (ASPs), should be considered a potential avenue for E-Business adoption in the SME sector (Yao et al, 2003; McCarthey et al, 2005). ASPs emerged in the late 1990s offering the opportunity for SMEs to cope with rapid change, uncertainty and increased competition (Lacity and Willcocks, 2001). An ASP is an organisation that manages, maintains and delivers IT/IS capabilities to businesses through a network. The ASP model offered several advantages for the SME sector, and compensated for any lack of enterprise IT/IS skills, providing the potential of cost reduction, increased flexibility and strategic goal realisation (Currie and Seltsikas, 2001; Yao et al, 2003; Yrle et al, 2004).

However, using an ASP presents problems in loss of independence, technical problems, selection of an appropriate provider and the need to negotiate an effective contract (Yrle et al, 2004). ASP usage in SMEs remained at an evolutionary and immature stage due to the lack of suitable providers within the sector (Currie, 2004). In time, this position should improve and SMEs will encounter another potential option to enabling E-Business usage and adoption (Boekhoudt and van der Stappen, 2004). The enterprise website remained the core facet of E-Business implementation (Levy and Powell, 2003), which was considered in the next section.

3.7 Website Evaluation

An effective website has been recognised as a central focus to the successful implementation of E-Business (eCIC, 2005) and potentially, increased business profitability, which has witnessed a significant increase in usage within SMEs (eCIC, 2005). Thus, it was essential that the website meets the organisational needs and understands the requirements of its users, otherwise it will result in end user and business dissatisfaction (Bentley et al, 2003) and damage the reputation of the enterprise (Kim et al, 2003).

Websites provide a number of potential benefits to the SMEs including: -

- reduced transaction, advertising and distribution costs (Dholakia and Rego, 1998)
- removal of third party intermediaries (Beatty et al, 2001)
- reduced time to complete transactions (Dholakia and Rego, 1998)
- enhanced information provision (Beatty et al, 2001)
- the ability to gather market intelligence through consumer behaviour observation (Isakowitz et al, 1998; Beatty et al, 2001)
- the ability to provide customised advertising (Liu et al, 1997; Tenenbaum, 1998)
- promotion and services opportunities (Tenenbaum, 1998)
- operational benefits in reduced clerical errors and reduced overhead costs (Liu et al, 1997)
- faster product/service response time to market (Dholakia and Rego, 1998).

Levy and Powell (2000) suggested that the introduction of a website and its sophistication was likely to reflect its business growth intention. The literature recognised that users were more likely to revisit a website, if they found the information they required and made a transaction if the design was efficient, with effective navigation (Salem et al, 1998; Shang and Dran, 1999). Moss et al, (2006) suggested website design should be gender specific. Good website design practice was multi-faceted and a complex process, however the literature agreed on the following elements. In terms of website page design, effective design included more content, smaller page sizes, less graphics and greater font variation (Ivory et al, 2001). Content of the website would be appropriate (Bevan, 1998), accessible (Murphy, 1999), comprising quality information in the correct quantity (Abels et al, 1998).

Usability of the site could be judged on key elements such as quality (Gefan and Straub, 2003) and effectiveness of the links (Abels et al, 1998; Rattanawicha and Esichaikul, 2005), minimal download time

(Bellman et al, 1999) and ease of navigation (Zhang and von Dran, 2002, Rattanawicha and Esichaikul, 2005). The content should be accurate, complete, up-to-date and easy to understand (White and Manning, 1998) including information on the site owner and contact details (E-mail, telephone and address of the enterprise) (Rattanawicha and Esichaikul, 2005).

In terms of design standards, it was important that there was consistency in the design of the website display (Murphy, 1999), including multimedia, the colour and graphics presented ensuring that it was visually attractive (Murphy 1999; Simeon, 1999), and had a professional appearance (Rattanawicha and Esichaikul, 2005). Key elements for a high quality website included: firstly, an index page or site map which were indicators of the extensiveness of a website and encouraged further navigation (Dholakia and Rego, 1998; Rattanawicha and Esichaikul, 2005). Secondly, search tools and multi-language support (Rattanawicha and Esichaikul, 2005). Thirdly, the provision of accurate information on details, pricing and availability of the product of service (Rattanawicha and Esichaikul, 2005). Fourthly, a security mode including use of customer logins, passwords, information on third party assurance or a seal of approval and product and service warranty (Rattanawicha and Esichaikul, 2005).

Finally, an effective website would include signs of customer and vendor achievement, including achievement awards, years of service, visitor counters, customer reviews, an enterprise privacy policy regarding customer information, and an explanation of how to use the system (Rattanawicha and Esichaikul, 2005). An effective website should invoke feelings of enjoyment and participation, providing decision aids for customers and use humour where appropriate (Rattanawicha and Esichaikul, 2005). To involve the end user, the enterprise should provide precise and accurate feedback, including E-mail confirmation on customer transactions and customer order tracking (Rattanawicha and

Esichaikul, 2005). This process reassures the potential customers into the robustness and validity of the system.

To assess the presence and effectiveness of such factors, Hong and Kim (2004) and Oliveira and Joia (2005) noted the existence of several systemised evaluation frameworks assessing several criteria. Well known frameworks included, Aladwani and Palvia (2000), Huizingh (2000), Barnes and Vigden (2002), Ranganathan and Ganapathy (2002), Kim et al, (2003), Van Der Merwe and Bekker (2003), Piccoli et al, (2004), Yeung and Lu (2004), Auger (2005) and Singh, et al, (2005). Considerable commonality existed between these frameworks and they typically assessed the effectiveness of website usability, appearance, design, structure, content, technical adequacy, reliability, and navigation against a ranking scale. Perhaps, unsurprisingly, Huizingh (2000) found that larger websites were richer in content and design than their smaller counterparts, whilst Chen and Wells (1999) and Chen et al, (2002) demonstrated that positive website attitudes depended on entertainment value, in formativeness and its organisation experienced from usage.

The implementation of effective web design principles within the SME sector was questionable, as evidence suggested that many had not developed, or progressed, over time and remained in a dormant state for perpetuity (Alonso Mendo and Fitzgerald, 2005b). Indeed, several studies reported a drop in usage of websites and E-mail (DTI, 2003; Potter and Pickernell, 2004; eCIC, 2005). Thus, it was important to examine the extent and effectiveness of website usage within the SME sector. The following sections explored the usage of E-Business within both a UK and Wales context to assess and contrast the applicability of the E-Business literature discussed thus far.

3.8 Levels of E-Business Utilisation

The following sections, contrasted UK E-Business utilisation against other nations and, secondly, appraised how Wales compared with other

UK regions. Trends in key E-Business factors were charted by undertaking a longitudinal comparison of a number of surveys. All identified surveys within Wales were compared and contrasted and key trends recognised and appraised.

3.8.1 Global E-Business comparison

The purpose of this section was to contrast E-Business usage in the UK against other countries and identify the influence of the key parameters under investigation. The methodological validity of these surveys was considered within Sections 3.8.6-3.8.9. The "DTI Business in the Information Age" study (DTI, 2004) provided the most effective comparative mechanism for evaluating E-Business trends on a global basis, due to its currency having been available every year since 1997, consistency of analysis, global coverage of 11 nations and range of enterprises sampled. Other surveys were considered for inclusion, but rejected due to the age of the data (Eurostat, 2002) and the reliability and relevance of the information presented (Golden and Griffin, 1998; Lymer et al, 1998; Daniel and Myers, 2000; Deloitte and Touche, 2000; Observatory, 2000; Scottish Enterprise, 2001; Actinic, 2005). Wherever possible, longitudinal comparisons were made with previous DTI surveys (e.g. 2000-2004), to indicate ongoing usage trends.

The DTI (2004) survey reported on the development of E-Business within the UK and ten other countries (i.e. Australia, Canada, France, Germany, Italy, Japan, Republic of Ireland, South Korea, Sweden and USA). In the study, the following business types were sampled:-

- micro (0-9 employees)
- small (10-49 employees)
- medium (50-249 employees)
- large businesses (250 plus employees).

Overall, the study revealed significant variations in levels of E-Business deployment across industrial sectors. In terms of sophisticated E-Business usage, the UK performed well, achieving the third highest ranking behind Sweden and Ireland. The study found that 95% of all enterprises surveyed had Internet access (96% in the UK), with minimal variation across other nations, with the exception of France (88%). Website deployment in the UK was identified at 85%, which compared favourably to the rest of the nations surveyed, averaging 75% (France lowest with 55%). The 2004 survey identified a decline in website usage in Japan and Italy, most significantly within micro-sized SMEs. The study found that financial services businesses had the highest levels of adoption and connectivity, whilst businesses in the primary and construction sectors had the lowest. For example, in the UK, 96% of UK financial services enterprises operated a website, as opposed to 80% of UK construction and 74% of primary businesses. Significantly, website deployment varied significantly between SME sized classifications, with 51% of micro (+11% points between 2002-2004), 77% of small (+14%), 89% of medium (+4%) and (plus two per cent) enterprises.

The variations in E-Business uptake between industrial sectors could be attributed to the inherent differences in business processes. For example, manufacturing enterprises were more likely to utilise systems, which were integrated with suppliers than more service-orientated organisations. Usage of local area networks (LANs) in the UK averaged 83% (plus six per cent on 2003), and proved highest in financial services enterprises (96% in UK, 91% rest of the world (RoW) and lowest in construction (79% in UK, 65% in the RoW). Elsewhere, Italy identified the lowest adoption level (59%) with Ireland the highest at 87%. Wide area networks (WANs) usage in the UK proved more significant averaging 58%, giving the second highest ranking behind Sweden (61%). Usage in the industrial sectors varied from 82% of UK financial services, in comparison to 48% of construction industries (significantly better than the rest of nations surveyed with 61% and 25% respectively). Internationally, WAN usage has declined in several nations (South

Korea, France, Australia, Japan and the USA) and increased in the UK, Ireland, Sweden and Germany. Sweden provided the highest adoption levels, whilst Italy ranked the lowest. Usage of technologies such as EDI and extranets, proved less significant in relation to other technologies, but satisfactory in terms of comparative performance against the RoW, with an overall usage averaged at 33% (24% other nations surveyed) and 29% (24%).

Within the UK, there has been a significant increase by micro (+16%) and small (+16%) sized enterprises using a website since 2003 (Table Seven) (DTI, 2002; DTI, 2003; DTI, 2004). The levels of E-Business within medium enterprises continued to increase (plus three percentage points), whilst large business had almost reached saturation point in terms of maximum deployment (95%). The DTI (2004) identified that falling prices of website design, lower connection costs and a better understanding of potential benefits, have provided the driving forces. In comparison with other nations, the UK ranked fourth for micro-enterprises and third for small-businesses. Ireland (63%) and Germany (56%) had the greatest proportion of micro-sized enterprises with a website; Italy demonstrated the greatest decrease, with a fall of 14% points, and France the lowest utilisation at 18%.

In small businesses with a website, Sweden (89%) achieved the highest rated, whilst South Korea demonstrated the largest gain (24%) and Japan and France the lowest ranking of 53%. The UK was the top ranked nation in providing information about products and services for customers online (73%), although there was significant variation by sector. The number of enterprises that placed orders online within the UK was less significant (56%), ranked fourth against other nations. However, the UK's performance in enabling customers to order online was less satisfactory, with only 37% of enterprises providing this capability (ranked sixth out of 11 nations), although improving, with a growth rate of 5% between 2002 and 2004.

Table 7: SME usage of a Website by Percentage				
Enterprise Type	2002	2003	2004	% change 2002-2004
Micro	40	35	51	+11
Small	63	61	77	+14
Medium	85	86	89	+4
Large	93	95	95	+2

When evaluating the performance of UK enterprises in utilising advanced E-Business technologies, a mixed picture emerged. Table Eight revealed an increasing usage of online trading across all enterprise sizes for the last four years (DTI, 2001; DTI, 2002; DTI, 2003; DTI, 2004). The micro-sized sector revealed the lowest level of utilisation in comparison to other enterprise sizes, although usage increased by 12% points since 2001. The UK performed well in levels of integrated internal systems which enable enterprises to automate linkages between systems and share information via intranets. The UK was ranked second in comparison to other nations, with 27% of enterprises identifying system integration. The measure of enterprises linking an ordering system to other internal systems was less conclusive, with 15% recorded (ranked fourth in survey), a trend which remained constant since 2003. Similarly, the DTI surveys revealed that few enterprises (13%, ranked sixth, a drop of two per cent since 2003) that interacted online had integrated their systems with those of their suppliers or their customers (21%, ranked third, an increase of one per cent since 2003).

Table 8: Trading Online by Business Size in UK as a Percentage					
Enterprise Size	2001	2002	2003	2004	% change 2001-2004
Micro	18	16	17	30	+12
Small	19	19	22	31	+12
Medium	23	23	29	33	+10
Large	27	31	38	42	+15

When the significance of E-Business to enterprises was evaluated, a number of trends emerged. The UK was ranked fourth in terms of contribution of online sales, as a percentage of total sales, with 19% (plus

five percentage points on 2003). Online sales represented a significant proportion of overall sales in the business. In terms of purchasing online, UK enterprises identified 24% of overall purchases undertaken, which achieved a disappointing ranking of tenth against other surveyed nations, although it did represent the highest increase on the previous year (plus eight percentage points). When evaluating the impact of E-Business, 32% of UK businesses (ranked fourth, plus four percentage points on 2003) identified that they measured the cost of technology, whilst 26% (ranked fourth, plus five percentage points) of enterprises identified that they measured the benefits attained. In the UK, enterprises identified the key drivers of E-Business as increased efficiency (21%), customer communication (16%), making progress (14%) and reducing costs (12%). Overall, 89% of UK businesses, considered E-Business to offer potential benefits to their business productivity and efficiency.

The most significant barriers to implementing E-Business was identified as initial set-up cost (33%), running costs (17%), IT skills (14%) and lack of time/resources (12%). Interestingly, 77% of SMEs (ranked second, plus four percentage points on 2003) within the UK had a formal business plan. In terms of IT/IS strategy, 24% of UK enterprises identified a specific document, whilst 32% reported that this existed as part of their overall business plan. In terms of IT skills, only 16% of UK enterprises identified that they were completely satisfied, whilst 61% suggested that they were mostly satisfied. To overcome this issue, 43% of enterprises identified providing IT skills training on an ad hoc basis when required, 28% outsourced all training and only 26% provided regular structured training.

In summary, the indicators suggested that the UK was demonstrating increasing levels of E-Business uptake and performed strongly against other nations within the DTI (2004) surveys and its predecessors. The evidence indicated an increased level of sophistication and uptake in contrast to prior studies (Quayle, 2003). There remained however, a limited uptake of fully enabled E-Business technologies, which improved

enterprise linkages with both customers and suppliers. Significantly, in some categories, e.g. connectivity and trading online, the micro-sized SME sector demonstrated an inferior performance in comparison with the larger-sized businesses. This provided further evidence that larger-sized enterprises utilised E-Business more effectively than micro-sized enterprises (Poon, 2000; Doherty et al, 2001). Therefore, there was a need to investigate why micro-sized SMEs were not utilising E-Business to its fullest potential, which provided significant evidence towards the fulfilment of the first research aim of this thesis. The next section contrasted Wales E-Business performance against other regions within the UK.

3.8.2 UK comparison

The DTI (2004) survey enabled comparison between Wales E-Business performances in 22 factors, against 11 other regions in the UK (Table Nine). This provided a picture of under achievement in comparison to these regions as suggested within Mitchell and Clark, (1999). Of the 22 factors that were analysed, Wales was ranked last (12th out of 12) in six of these areas, 11^{th} in five areas and 10^{th} in four areas. Wales only achieved five top six rankings and an overall average ranking of ninth (Table Nine). This analysis placed Wales as the worst but one performing region, with only NI deemed inferior. Wales performed poorly in contrast to the rest of the UK in access to the Internet, use of E-mail, online trading, ordering online, paying for goods online, enterprises that enabled customers to pay online.

In terms of barriers to implementing E-Business, set up cost was identified as the most significant inhibitor with 51%, an increase of 16% points on 2003. Other key barriers were identified as running costs (35%), lack of time and resources (19%) and a deficiency of IT skills (13%). Access to the Internet within Wales had decreased marginally, from 93% in 2002 to 88% in 2004. In addition, LAN usage within enterprises has decreased from 74% in 2003 to 70% in 2004. Wales and

NI have the lowest proportion of businesses with internal network technologies, which were integrated. Similarly, the trend for businesses with external E-mail (85%) showed a decline of two percentage points since 2002. By contrast, enterprise usage of websites has increased significantly to 79%, a growth of 7% points since 2003, and WAN uptake had increased by eight percentage points to 53%. The trend for enterprise usage of intranets has increased from 38% in 2002 to 51% in 2004 (plus 13% points). The trend of reduced utilisation of certain IT/IS functions (e.g. E-mail and Internet access) could potentially be attributed to enterprise closure within the SME sector.

In summary, E-Business usage trends within Wales were generally positive, with increased levels of uptake. However, Wales performance, in comparison to other UK regions, was indifferent, with only NI recording an inferior ranking. It was noticeable that usage trends of advanced E-Business technologies, identified in the global study of UK E-Business uptake (DTI, 2004), was mirrored within the regional analysis. There was a need to undertake further research to investigate the ongoing uptake of E-Business within Wales, which was considered next.

3.8.3 Analysis of studies into the use of E-Business in Wales

This section identified the levels of uptake and utilisation of E-Business within the SME sector in Wales, to understand the factors driving and inhibiting usage. Andrew Davies, Minister for Economic Development in Wales, described E-Business development within Wales as central to government strategy and of critical importance to the future prosperity of the country (WAG, 2003). The development of the E-Business function in Wales provided a core component of the WAG's 'Winning Wales' strategy, the central focus of which, was to increase economic prosperity.

ıble 9: Comparison of Wales E-Business Performance against other UK Regions (DTI 04) by Percentage and Ranking

ctor sults display a % as a proportion businesses operating these hnologies and a ranking against ıer Regions.	Wales	Scotland	Northern Ireland	North East	North West	Greater London	Yorks & Humber	East Midlands	West Midlands	East of England	South East	South West
siness measuring the costs of hnology	**50** **6**	50 6	49 9	58 2	46 11	52 5	44 12	54 3	50 6	60 3	54 4	47 10
siness measuring the benefits of hnology	**53** **6**	46 11	47 10	57 2	55 3	52 8	44 12	52 7	53 5	51 9	58 1	54 4
portion of IT skills meeting the ds of the business	**73** **10**	74 9	69 12	76 7	77 6	71 1	77 5	79 3	76 8	78 4	82 1	81 2
cess to the Internet	**88** **12**	93 10	89 11	94 7	95 5	98 1	94 7	96 2	96 2	95 5	96 2	94 7
siness with a website	**79** **11**	83 8	75 12	88 2	83 8	91 1	86 6	88 2	86 6	82 10	87 4	87 4
siness with external E-mail	**85** **12**	91 10	87 11	95 2	94 6	96 1	93 7	95 2	93 7	95 2	95 2	93 7
siness with a LAN	**70** **11**	80 8	69 12	80 7	85 2	89 1	78 9	84 4	81 6	83 5	85 2	77 10
siness with a WAN	**53** **7**	50 11	38 12	52 9	57 4	69 1	53 7	60 3	56 5	54 6	61 2	51 10
siness with wireless LAN	**22** **10**	25 8	18 12	26 7	28 4	32 2	27 5	35 1	25 8	22 11	30 3	27 5
siness with an intranet	**48** **8**	51 7	42 12	54 6	57 4	62 2	55 5	64 1	46 11	49 9	61 3	46 10
siness trading online	**26** **12**	41 2	28 11	34 6	41 2	44 1	32 9	41 2	30 10	34 6	39 5	34 6
siness that order online via an e-rket place or exchange	**14** **12**	26 1	18 9	20 4	20 4	20 4	17 11	19 7	19 7	22 3	25 2	18 9
siness that place orders online	**51** **11**	64 2	51 11	55 7	61 4	66 1	58 6	59 5	52 10	54 8	64 2	53 9
siness that pay for goods and vices online	**24** **12**	37 1	25 10	32 5	30 7	34 2	33 3	30 7	25 11	30 7	31 6	33 3
siness that allow customers to order line	**39** **4**	33 11	27 12	37 5	41 2	36 7	33 10	37 5	43 1	35 8	39 3	35 8
siness that allow customers to pay line	**12** **12**	22 5	15 10	18 9	26 1	24 3	15 10	25 2	21 7	22 5	24 4	19 8
siness with an ordering system ked to other internal systems	**9** **11**	8 12	10 9	15 5	22 1	15 6	10 9	17 4	19 3	11 8	21 2	17 4
siness with integrated internal stems	**61** **11**	70 6	53 12	65 9	68 7	68 7	71 3	71 3	71 3	72 2	79 1	63 10
siness with systems integrated with stomers	**24** **6**	20 10	20 10	15 12	21 9	35 1	34 2	22 8	29 3	27 4	27 4	23 7
siness with systems integrated with ppliers	**22** **1**	17 8	16 9	15 11	22 1	20 4	18 6	19 5	19 5	18 6	21 3	16 9
nline orders for business that order line	**15** **10**	20 6	15 11	21 4	21 4	22 2	11 12	22 2	16 9	17 7	23 1	17 7
nline sales for business that sell online	**15** **10**	20 6	15 11	21 4	21 4	22 2	11 12	22 2	16 9	17 7	23 1	17 7
verage Rankings	**9**	7	11	6	5	3	8	4	6	6	3	7

ey:
row of numbers = % occurrence of this factor
row of numbers = performance rank against other UK regions

Several surveys have been undertaken by both government related agencies and academia, investigating E-Business development within SMEs in Wales. The following sections evaluated, compared and contrasted these surveys to identify key trends.

3.8.4 Academic E-Business studies in Wales

Table 10 listed all academic studies regarding E-Business in Wales, reported in journal and conference literature, within the last seven years. This review revealed a limited literature with only six relevant studies. The Jacobs and Dowsland (2000) and Owens and Beynon-Davies (2001) studies presented general investigations into initial uptake and enthusiasm for E-Business within Welsh SMEs. Thereafter, the remaining studies involved a specific context of E-Business utilisation. The Lewis and Cockrill (2002) study investigated E-Commerce utilisation within retail SMEs. Jones et al (2003b) provided analysis of barriers to E-Business growth, whilst the Murphy and Symonds (2004) study, investigated E-Business uptake within urban and rural SMEs.

Potter and Pickernell (2004) profiled E-Business utilisation with particular reference to infrastructure within Wales. Reference was made to several further studies undertaken within a Welsh context, including Muir et al, (2001), Davies et al, (2004) and Davies et al, (2005). They were not considered within this section as Muir et al, (2001) focuses exclusively on entrepreneuses, whilst Davies et al, (2004) and Davies et al, (2005) were reported within the eCIC reports identified within Section 3.8.5. Jacobs and Dowsland (2000) noted in 2000 that Welsh enterprises were lagging behind their Scottish and English counterparts, although there was strong interest in E-Business and its potential for the SME community. Owens and Beynon-Davies (2001) survey reported high levels of Internet access (92%) and website (50%) utilisation, with typical usage being E-mail (87%), information (77%) and advertising (50%). However, they found minimal applications of advanced E-Business functions such as online sales (15%) and purchasing (32%).

Table 10: Identification of Academic Surveys in Wales					
Study	Year of Study	Sample Size	SME size %	Type of Survey	Area Covered
Jacobs and Dowsland	2000	42	Not identified	Postal	Swansea
Owens and Beynon-Davies	2001b	60	1-9 = 28 10-50 = 32	Postal	Cardiff, Bridgend, Newport and Valleys
Lewis and Cockrill	2002	25	1-4 = 3 5-9 = 11 10-24 = 7 25-60 = 4	Postal	Wales
Jones et al,	2003b	100	1-9 = 36 20-49 = 42 50-249 = 18	Postal and Telephone	Cardiff, Bridgend, Newport and Valleys
Potter and Pickernell	2004	166	1-49 = 71 50-249 = 29	Postal	Not identified
Murphy and Symonds	2004	16	1-4 = 25 5-9 = 25 10-24 =50	Interview	Powys and Newport

Lewis and Cockrill's (2002) study focused on the impact of E-Business on the retail SME community. The results of this study were contrasted against the six-step E-Commerce Adoption Ladder developed by Cisco for the DTI (2000). The study found extremely limited deployment of sophisticated higher E-Business levels technologies. The main driver to E-Business usage was identified as the desire to gain quality benefits (35%). When asked about the uses of their website, 62% of respondents identified using their website as a promotional tool to inform and entice customers and thereby potentially increase sales revenue.

The key inhibitors to E-Business uptake were identified as a lack of advice and support, lack of funds and skilled and qualified staff (44%). Survey participants identified benefits (88%) for participation in E-Business as indirect (reduced cost, quality benefit and time), quality related (71%) (access to new markets and customers) and direct (59%) (cost reductions and time savings). When queried regarding strategic

planning of the E-Business function, only four per cent of respondents identified they had adopted such a strategy. The vast majority identified that E-Business deployment was ad hoc.

Jones et al, (2003b) discovered 98% of enterprises surveyed, had access to the Internet and its main uses identified as finding information (90%), E-mail (88%) and advertising and marketing (62%). The majority of enterprises (77%) possessed a website, which was utilised for advertising and marketing information to customers and distributing information to suppliers (18%). By contrast, only 13% of enterprises identified that they were using their website for online sales; these statistics were significantly inferior for micro-sized SMEs.

Murphy and Symonds (2004) assessed E-Business adoption against a self-selected 'ladder of connectivity' without verification, to measure E-Business sophistication for urban and rural enterprises. The framework identified that 37.5% of rural enterprises had developed an effective website and 37.5% an online store. By contrast, urban enterprises were less advanced, with 75% only developing E-mail and web browsing capability and 25% a basic web presence. Customer demand was acknowledged as the most significant driver for E-Business in rural locations (60%) and urban enterprises (38%). Inhibitors to E-Business deployment were described as lack of bandwidth (50%), customer resistance (38%) in rural locations and staff resistance to change in urban locations (72%).

Potter and Pickernell (2004) observed that Wales E-Business sector was in a state of gradual growth, although the northern and western parts of the country lagged behind, causing a digital divide. The main inhibitors to E-Business usage within SMEs was identified as the lack of broadband availability in rural areas, the costs associated with access and deficiency of IT/IS education. E-Business was identified as important (69%) to their business. However, when questioned regarding the E-Business planning process, only 56% identified that they had a business plan and

the majority of these (51%) excluded reference to its implementation. The majority of SMEs (74%) identified using networked computers (68% of small and 89% of medium sized SMEs). Website maintenance was relatively ineffective, with only 38% of small and 53% of medium sized SMEs making provision for this facility.

The provision of IT/IS training was another disappointing feature reported, with only 51% of SMEs (44% small and 67% of medium sized SMEs) claiming in-house expertise and 34% (33% small and 37% medium sized SMEs) providing any formal training. Levels of integrated technology with customers (19% overall, 11% small and 39% medium sized SMEs), suppliers (15% overall, nine per cent small and 30% medium sized SMEs) and partners (eight per cent overall, five per cent small and 16% medium sized SMEs) remained low, especially within the micro-sized SMEs. Potter and Pickernell (2004) argued the importance of continuing education programmes and ongoing IT/IS training to support and encourage E-Business development. The key trends drawn from these surveys were summarised in Section 3.9.

3.8.5 Public sector E-Business studies in Wales

This section considered public sector studies investigating E-Business utilisation within Wales during the last seven years (Table 11). Within the context of this study, public sector bodies were constructed by government departments or supported bodies. The basis for this analysis was annual reports published by the DTI, eCIC and bi-annual studies by the Federation of Small Businesses (FSB). The DTI study represented part of a whole UK study, whilst the eCIC reports focused purely on Wales. Both the FSB and eCIC surveys were written by Universities but funded by European monies for public sector consumption. These reports focused on E-Business application and usage uptake, with no consideration or contrast against prior academic research. Within the FSB surveys, E-Business represented only one out of eight facets of SME development considered. Furthermore, the WDA (2001), WDA (2002)

and Wales Management Council (2003) reports were considered for inclusion within this review, but found to be utilising data from DTI surveys, which were already considered within this review.

The NOP (2000) study revealed informal sources of advice, such as word of mouth, as the most popular form of guidance available for the SME sector (66%) as opposed to formal business advice services, e.g. banks/accountants (45%), journals (43%), newspapers (35%), exhibitions (29%) and the Internet (28%). The survey revealed that only a minority of Welsh SMEs had an IT/IS plan or strategy, with less adoption within the micro-sized SME classifications "Sole-Proprietor" (17%), two to four (19%), five to nine (23%), 10-249 (44%). When asked to assess the effectiveness of their E-Commerce operation, 26% identified that they had received more inquiries and sales, 16% more enquiries and six per cent higher sales. Less than half of SME Owner/Managers believed that E-Business would have a significant impact on their industry and 39% believed their own usage of IT/IS was lagging behind the industry norm. The survey revealed that Welsh SMEs were localised in their market orientation, with 54% trading in local town/city, 57% in Wales, 26% in the UK and only 14% in Europe and RoW. This market orientation was most significant within the wholesale/retail (62%) markets and least significant within financial services (39%).

The FSB (2006) study examined E-Commerce impact on the SME, and revealed only limited usage of E-Commerce among respondents; 18% bought online, 18% sold online, eight per cent bought from eBay and four per cent provided an online after sales service. The main reason provided, why businesses failed to trade online, was identified as the perception of the Owner/Manager that it was inappropriate for their enterprise (23%).

Table 11: Identification of Public Sector Related Surveys in Wales

Study	Year	Sample Size	SME Size %	Survey Type	Geographical Area
DTI Benchmarking Study	2000	200	1-9 = 25, 10-99 = 25, 100-249 = 25, 250+ =25	Telephone	Wales (as part of UK study)
NOP SME Wales Survey	2000	1826	Sole-Proprietor= 17, 2-4 = 44, 5-9 = 19, 10-249 = 20, 250+ = 0.4	Telephone	Wales
DTI Benchmarking Study	2001	200	1-9 = 25, 10-99 = 25, 100-249 = 25, 250+ = 25	Telephone	Wales (as part of UK study)
FSB	2002	737	0-3 = 16, 4-5 = 14, 6-10 = 21, 11-20 = 24, 21-30 = 15 31+ = 8	Postal	Wales
DTI Benchmarking Study	2002	200	1-9 = 25, 10-99 = 25, 100-249 = 25, 250+ = 25	Telephone	Wales (as part of UK study)
DTI Benchmarking Study	2003	200	1-9 = 25, 10-99 = 25, 100-249 = 25, 250+ = 25	Telephone	Wales (as part of UK study)
eCIC State of the Nation report 2002/3	2003	7769	1 = 20, 2-4 = 38, 5-9 = 18, 10-49 = 19, 50-249 = 3	Postal Telephone	Wales
DTI Benchmarking Study	2004	200	1-9 = 25, 10-99 = 25,100-249 = 25, 250+ = 25	Telephone	Wales (as part of UK study)
eCIC State of the Nation report 2003/4	2004	2826	1 = 24, 2-4 = 39, 5-9 = 15 10-49 = 18, 50-249 = 4	Postal	Wales
FSB	2004	836	1 = 9, 2-4 = 28, 5-9 = 20 10-49 = 16, 50-99 = 1, 100+ = 0.4	Postal	Wales
eCIC State of the Nation report 2004/5	2005	2537	0-9 = 72, 10-49 = 21, 50-249 = 7	Telephone	Wales
FSB	2006	881	0 = 8, 1 = 10, 2-4 = 39, 5-9 = 21, 10-49 = 18, 50-99 = 1, 100+ = 0.1, Not answered = 0.1	Postal	Wales

Other barriers to E-Commerce included the high cost of developing and maintaining a website (16%), risk of credit card fraud (16%) and lack of IT/IS employee skills (13%). For enterprises currently engaged in E-Commerce, online activity accounting for only a small proportion of

turnover. Website enabled sales accounted of up to 10% of turnover were evident within 16% of enterprises surveyed. Thereafter, four per cent generated between 11%-25% of turnover from their own website. Most enterprises reported that online sales had made little or no impact on their customer base. However, 15% reported that new UK customers had been attracted and a small proportion noted acquiring new overseas customers. When SME Owner/Managers were questioned, whether they were going to invest in IT over the next two years, only 30% responded, of which, 25% were positive.

The DTI (2004) study identified that Welsh enterprises were not driven by their competitors to adopt technology (ranked 11th out of 12 regions) and, of those that were, only 39% had implemented an IT/IS solution. Wales' performance was indifferent in measuring the cost (50%, ranked sixth) and benefit (53%, ranked sixth) of technology. Within the enterprise, Owner/Managers identified that 73% ranked 10th of their organisations' IT/IS skills, met the needs of the business. In terms of barriers, respondents identified high set up costs (51%), running expenditure (35%), limited time and resources (19%), insufficient skills (13%) and a deficiency of knowledge (nine per cent) as the prevalent inhibitors to E-Business usage. In terms of connecting to the Internet, 44% used broadband, which ranked Wales 12th out of 12 in contrast to other UK regions.

The 2005 eCIC report identified that 72% of SMEs utilised computers, although there was a significant variance in usage by business size, from 66% of enterprises with one employee, to 100% of those with 100-249 employees. Usage varied by industry sector, ranging from 32% of agricultural SMEs, to 99.8% of businesses in the "Professional Services" sector. Usage of an Internet connection in SMEs was widespread (66%) and a further 5% planning to introduce access in the next 12 months. Twenty-eight per cent, however indicated that they were not using, and had no plans to use, the Internet. Internet access varied by size band and ranged from 66% of micro-sized, to 72% of small and 71% of medium-

sized businesses. Industry sector appeared to be an influencing factor, with the majority of medium-sized enterprises (50-249 employees) in the "Manufacturing" sector, reported 72% of businesses with Internet access. A large proportion of small-sized enterprises (those with 10-49 employees) were in the "Retail and Wholesale" or "Other Services" sectors, which reported access of 69% and 77% respectively. Of connected businesses, 60% had Internet access for more than three years, 36% for one to three years.

The eCIC (2005) report also identified the proportion of businesses with broadband access to the Internet had risen considerably, mainly at the expense of analogue dial-up and integrated services digital network (ISDN). For example, 42% of connected respondents stated they had an Asymmetric Digital Subscriber Line (ADSL) broadband connection this year, with 32% using an analogue dial-up modem connection. ADSL coverage in Wales increased during the summer of 2005 and was available to 99% of homes and businesses in the UK. ADSL broadband was the most common connection method amongst SMEs of all sizes in Wales, with micro-sized businesses showing the greatest use of dial-up modem access.

In terms of staff usage of the Internet, including E-mail and surfing the web, as part of normal work routine, 54% of connected businesses stated that between 75% and 100% of staff used the Internet on a daily basis. Only two per cent of businesses stated that no staff used the Internet on a daily basis. The average percentage of staff using the Internet on a daily basis among survey respondents overall was 79%. The average percentage of staff using the Internet varied by SME size classification from 79% in micro, 84% in small and 39% in medium-sized enterprises. Industry sector was also a factor, with the percentage of staff varying from 58% in the "Construction" sector to 73% in "Manufacturing" and 97% in "Professional Services". In terms of E-Business planning, only 1.6% of connected businesses and those planning to connect, stated that they have developed and implemented a plan, whilst 14% identified

being in the process of developing a plan. Significantly, when analysed by business size, only 1.6% of micro, 1.2% of small and 9.1% of medium-sized businesses undertook a planning process.

With regard to training provision within enterprises, results differed by business size. The most common method amongst micro-sized SMEs proved to be staff self-teaching whilst "on the job" (24% and 20% respectively). However, 6% of micro-sized SMEs stated that they had no means of addressing any IT skills shortfall. Small businesses (those with 10-49 employees), indicated a greater use of internal training, whether on an ad hoc or regular basis. The main method of addressing skills in medium-sized businesses was internal training on an ad hoc basis (27%), with equal proportions relying on staff self-teaching, regular internal training and outsourcing training provision (18% respectively). Forty-one per cent of micro-sized businesses stated that a means of addressing IT skills was not required; this response ranged from 36% in small businesses to 18% in medium-sized businesses. These results could be a reflection of more basic E-Business activities and the associated skills required occurring within these enterprises. However, it might indicate a lack of forward planning in micro-sized SMEs, whereby a skills shortage was not identified in advance and the need to address such a deficiency was not recognised by the Owner/Manager until it had impacted.

In terms of drivers to E-Business, connected enterprises and those intending to connect in the next 12 months, 22% stated there were no specific drivers of E-Business for their business and six per cent did not know. Eighteen per cent recognised the need to increase reach to new customers, 16% create more efficient internal processes, 15% stay ahead of competitors and 13% increased customer satisfaction. Enterprises that planned to connect identified their drivers as the need to gain new customers (27%) and to improve efficiency of operations and internal process (26%). When asked to identify inhibitors to E-Business, 45% stated that there were no barriers. Otherwise, the most significant inhibitors were identified as not applicable/not required for business

(20%), high set up costs (14%), products/services not suitable for E-Business (eight per cent), did not understand the issues (five per cent) and insufficient skilled staff (five per cent). The results indicated that some Owner/Managers within SMEs in Wales still have a narrow perception of E-Business, as simply selling over the Internet, indicated by the responses that E-Business was not applicable to their business or that their products and services were not suitable.

All businesses have the potential to benefit from E-Business, e.g. in marketing and promotion. The cost of implementing E-Business remained a concern for Welsh Owner/Managers within SMEs, although the proportion indicating cost as a barrier appeared to have decreased in contrast to previous years. In terms of benefits attained through E-Business, 31% of respondents identified increased customer base, 22% more efficient internal processes, 20% improved supplier communications and 17% new business opportunities. Twenty-three per cent identified that they had attained no significant benefit from utilisation. The vagueness of this response was explained by the fact that only 11% of enterprises identified that they measured the benefits attained from technology exploitation on a regular basis. Overall, 40% of connected businesses planned to expand their use of E-Business in the next 12 months, ranging from 40% of micro and 37% of small, to 46% of medium-sized businesses. The findings of both academic and public sector studies was summarised in Section 3.9. Section 3.8.7 considered the statistical validity of these surveys.

3.8.6 Regional analysis of E-Business

The eCIC (2005) report presented a regional analysis of E-Business adoption within Wales whereby the nation was divided into EC Objective One and non-Objective One regions, as recognised within Section 2.5.1. The proportion of SMEs (70%) in non-Objective One regions of Wales with Internet access was higher than in Objective One areas (64%). The results also demonstrated that enterprises in Objective One areas

remained more dependent on analogue dial up access to the Internet than non-Objective One. The study indicated that 55% of connected enterprises in Objective One areas had implemented a website compared to 61% in non-Objective One areas. Overall 8% of enterprises within Objective One regions accepted online payments, in contrast to 10% in non-Objective One areas. Thirty-nine per cent of enterprises in Objective One purchased online, in comparison to 34% of non-Objective One.

The proportion of regions with a connection to the Internet varied from 58% in RCT, MT, Caerphilly, BG and Torfaen, to 77% in Monmouthshire and Newport. The Monmouthshire and Newport regions identified that 67% of enterprises connected to the Internet for more than three years, whilst the RCT, MT, Caerphilly, BG and Torfaen regions recorded only 52% connectivity. Sixty-two per cent of enterprises within Flintshire, Wrexham and Powys regions, utilised websites, in contrast to only 50% within RCT, MT, Caerphilly, BG and Torfaen. The proportion of enterprises accepting payments online varied significantly between regions, the lowest being four per cent in Swansea, Bridgend, Neath Port Talbot (NPT) and the highest in Cardiff and the VG region with over 10%.

The proportion of enterprises making payments online ranged from 32% in Cardiff and the VG to 48% in Anglesey, Gwynedd, Conwy and Denbighshire. Thus overall, the picture of E-Business usage within Wales was mixed and indifferent, with examples of high usage typically within more prosperous non-Objective One areas such as Cardiff and the VG (NOP, 2000; eCIC, 2005). This was, however, outweighed by the indifferent performance within the Objective One areas such as RCT and BG, where there remained a lack of widespread broadband infrastructure to facilitate E-Business implementation (NOP, 2000; eCIC, 2005) and sophisticated uptake of E-Business.

3.8.7 Statistical validity of surveys

This Section evaluated the statistical validity of both the academic and public sector surveys presented within sections 3.8.4 and 3.8.5. The surveys were evaluated for size of sample, statistical representation of the Welsh SME sector and geographical coverage of the country. A common criticism levelled at concomitant studies, was that respondents have a tendency to be self-selecting and consequently this may bias the sample (Westhead, 1998). In such E-Business surveys, it could be argued that only enterprises that were particularly interested and experienced in the use of such technologies were likely to respond to such a study. Equally, it was possible that enterprises, which were E-Business novices or non-users, may be less likely to respond. The multi-method data collection process discussed within Chapter Four enabled the study to overcome survey bias. Moreover, the reported surveys focussed on the technological aspects of E-Business. While this data was useful in analysing the current state and future usage of E-Business, it was rather limited in providing a rich understanding of the whole picture, e.g. how and why the technologies were being used and the reasons for transition towards higher levels of utilisation.

A number of issues affected the interpretation of various survey results. One issue concerned the definitions of SMEs, which were not a homogenous group - either in size or in nature - and the definition of an SME differed between survey reports. Table 11 demonstrated that a number of surveys included non-SME classified enterprises, namely the DTI surveys 2000-2004. Evidence suggested that larger non-SME classified enterprises benefited from higher levels of technology usage (DTI, 2004). Therefore, the results of these surveys were positively skewed and must be treated with caution. However, taken as a whole, these surveys revealed significant trends within the SME sector in Wales, which were discussed in the conclusions to this chapter.

3.8.8 Sample size and geographical coverage

Another concern with all these studies was their geographical coverage and sample size. All academic studies identified within Table 10 covered only certain geographical areas of Wales. In addition, the public sector studies, with the exception of the eCIC (2003-5) and NOP (2000) studies, were not geographically representative and were thus unrepresentative of the whole economy, bearing in mind the diversity in business activity and population in rural and industrial areas (Jones et al, 2003a). Therefore, such survey results must be viewed with caution in terms of their representation of SME E-Business performance. Another concern with these surveys was the size of the sample returns (Table 10 and 11).

None of the academic surveys (Table 10) was based on significant samples, ranging from 16 respondents in Murphy and Symonds (2004) to 166 in Potter and Pickernell (2004). Certain public sector studies, namely the eCIC (2003-2005) and the NOP (2000) reports did have large samples in excess of 1000 responses. The often cited DTI (2000-2005) surveys record a sample size of 200 respondents, including a significant sample of non-SME classified enterprises. Such low return studies provided a general indication of the general E-Business trends in Wales, although their results must be regarded with some caution. Greater significance must be awarded to the more representative eCIC (2000-2005) and NOP (2000) reports, due to their more significant geographical coverage and sample returns.

3.8.9 Representation of the Welsh SME sector

None of these studies evaluated was fully representative of the Welsh SME community, specifically the "Sole-Proprietor" segment, as identified within Section 2.2. As can be seen from Table 10 and 11, only the NOP (2000) survey represented the "Sole-Proprietor" sector as an independent group and this was under-represented in relation to the Welsh SME population. This was significant when you consider the

limited resources such enterprises have and that the "Sole-Proprietor" size sector accounted for 70% of all Welsh enterprises. All the other surveys grouped the "Sole-Proprietor" SME micro-sized classification within other employee classifications (e.g. "1-9" in DTI (2000-2005) and "1-4" size in Lewis and Cockrill, 2002) which distorted the true picture of the levels of E-Business utilisation within these enterprises.

3.9 Summary of E-Business Utilisation within Wales

The review of the academic and public sector reports was extremely informative in identifying key trends within the E-Business literature since 2000. The 14 surveys were contrasted in terms of their E-Business utilisation (Table 12, Section 3.9). As identified in Sections 3.8.6-3.8.8, the eCIC (2003-2005) and NOP (2000) studies represented the most realistic interpretation of E-Business deployment within Wales. The comparison revealed a number of emergent trends since 2000, with levels of basic E-Business technologies demonstrating significant growth. For example, Internet usage within Wales had undoubtedly significantly increased from 46% (NOP, 2000) to 66% in 2005 (eCIC, 2005). Similarly, website usage had increased to 58% (eCIC, 2005) from 20% in NOP (2000) and E-mail from 20% (NOP, 2000) to 58% (eCIC, 2005).

Uptake of more sophisticated E-Business technologies revealed minimal usage and even decline in several areas, as noted by both Lewis and Cockrill (2002) and Potter and Pickernell (2004). For example, eCIC (2005) reported minimal intranet (four per cent) and extranet (two per cent) utilisation which represented no growth, and even decline, since 2004. Similarly, eCIC (2003-2005) studies reported factors such as SMEs ordering online (49%), a decrease of one per cent from 2004, paying for goods and services online (37%), a decline of nine per cent from 2004, customers paying online (nine per cent), a decrease of one per cent from 2004 and trading online (27%), two per cent decrease since 2004, revealing growth between 2000 and 2003 and thereafter stabilisation and a diminishing usage trend. To clarify the reality

underpinning E-Business usage, a range of factors underpinning usage were investigated, including inhibitors, drivers, benefits, maintenance and training and strategic deployment as identified within Table 12.

eCIC (2005) identified that drivers to E-Business differed between existing and new users. SMEs that were not connected to the Internet identified the desire to attract new customers (27%) and improve efficiency (26%). Existing E-Business users identified their drivers as the desire to attain further customers (18%), more efficient internal processes (16%), staying ahead of competitors (15%) and improved customer satisfaction (13%). This evidence suggested that the perceived drivers of E-Business become more sophisticated and realistic with increased usage. However, 23% of SME Owner/Managers connected to the Internet, identified that there were no specific drivers to E-Business, which suggested a lack of awareness and naivety regarding the opportunities offered by sophisticated E-Business utilisation.

In terms of benefits attained from E-Business utilisation, Lewis and Cockrill (2002) differentiated between direct and indirect benefits. Indirect benefits were identified as access to new markets and customers. Direct benefits were identified as cost and time savings. Specifically, the eCIC (2005), FSB (2004) and NOP (2000) studies recognised that SMEs had obtained inquiries and sales and new business opportunities from the UK and overseas. In addition, the eCIC (2005) study identified efficiency gains from internal processes. However, over 20% of SMEs Owner/Managers within the eCIC (2005) and the NOP (2000) study identified no benefits obtained from their E-Business utilisation. This lack of obtained benefit required further investigation of the phenomenon and was further explored within Chapter Five, Six and Seven.

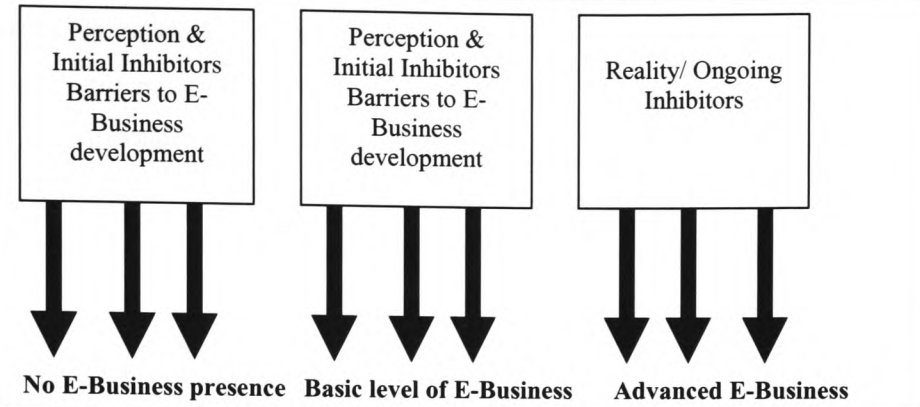
Table 12: Longitudinal Trend Analysis 2000-2005 as a Percentage

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
KEY N = Not applicable to survey	DTI (2000)	NOP (2000)	DTI (2001)	Owens & Beynon-Davies (2001)	DTI (2002)	FSB (2002)	Lewis & Cockrill (2002)	eCIC (2003)	DTI (2003)	Jones et al, (2003b)	FSB (2004)	eCIC 2004	DTI (2004)	eCIC (2005)
Internet access	83	46	92	92	93	64	N	57	91	98	73	57	88	66
Use of LAN	65	N	63	N	71	19	N	N	74	N	N	24	70	30
Use of WAN	29	N	43	N	40	N	N	N	45	N	N	3	53	3
Website	52	20	71	50	73	38	52	55	72	77	46	54	79	58
Wireless LAN	N	N	N	N	8	N	N	N	18	N	N	N	22	N
External E-mail	76	38	82	87	87	64	68	83	85	88	64	87	85	98
Intranet	42	N	54	N	38	N	N	N	48	N	N	6	51	4
Extranet	3	N	15	N	16	N	N	N	N	N	N	2	N	2
Order online via e-market place	N	N	N	N	N	N	N	N	16	N	N	N	14	N
Order online	23	20	26	32	44	45	12	38	48	N	33	50	51	49
Pay for goods services online	9	N	11	N	18	N	N	21	23	N	N	46	24	37
Customers can order online	27	8	28	15	32	N	N	N	27	N	13	N	39	N
Customers can pay online	17	N	13	N	10	N	N	6	13	N	5	10	12	9
Ordering system linked to internal systems	N	N	N	N	8	N	N	N	10	N	N	N	9	N
Integrated internal systems	N	N	N	N	N	N	N	N	61	N	N	N	61	N
Systems integrated with customers	N	N	N	N	N	N	N	N	22	N	N	N	24	N
Systems integrated with suppliers	N	N	N	N	N	N	N	N	14	N	N	N	22	N
Online orders	N	N		N	13	N	N	N	12	N	10	N	22	N
Online sale	N	N	N	N	15	N	N	N	18	N	N	N	15	N
Internet for marketing and advertising	52	N	N	50	N	N	52	20	N	62	43	38	N	28
Trading online	22	20	17	N	21	22	12	21	23	13	N	27	26	25

The most prevalent inhibitors to E-Business, were identified as limited bandwidth availability (FSB, 2004; Murphy and Symonds, 2004; Potter and Pickernell, 2004; eCIC, 2005), insufficient finance and high implementation cost to develop (NOP, 2000; Lewis and Cockrill, 2002; DTI, 2004; Potter and Pickernell, 2004; eCIC, 2005), inadequate time (DTI, 2004), deficient knowledge, advice and support (Lewis and Cockrill, 2002; DTI, 2004; eCIC, 2005) and a shortage of skilled and qualified staff (Lewis and Cockrill, 2002; DTI, 2004; eCIC, 2005). Other inhibitors were identified as customer (NOP, 2000; Murphy and Symonds, 2004) and staff resistance (Murphy and Symonds, 2004), not applicable to business operation (eCIC, 2005).

Jones et al, (2003b), in a pilot study to this thesis, differentiated between inhibitors to E-Business and their impact upon the SME (Figure 13) as perception and reality barriers, which had an initial and ongoing influence. Perception inhibitors, were defined as SME Owner/Managers and staff attitudes, caused by a lack of knowledge and understanding of factors such as: security, insufficient education into benefits and applicability, legal issues, employee reluctance and fears of competition (Poon and Swatman, 1999b; Mehrtens et al, 2001; Moini and Tesar, 2005). A process of continual education and reinforcement of the entrepreneur and employees can overcome these inhibitors.

Figure 13: Impact of E-Business Inhibitors on SMEs



(Source Jones et al, 2003b:20)

Reality inhibitors were defined as deficiencies in factors which all SMEs had to contend with, such as financial resources, available time and Owner/Manager and employee skills within the enterprise (Jones et al, 2003b). In addition, reality inhibitors existed outside the Owner/Manager's direct control, such as access to bandwidth in the locality of the enterprise. These factors required strategic direction from within the enterprise to manage, generate and improve with assistance where possible from outside bodies to develop these elements. Another important consideration was the way these inhibitors impacted upon the enterprise's operations, whereby Jones et al, (2003b) suggested two scenarios, namely initial or ongoing influence. Initially, an enterprise would have to overcome a mixture of perception and reality inhibitors to initiate an E-Business operation.

For example, there might be a need to educate the staff within the enterprise in order to overcome factors such as uncertainty about security issues, attainable benefits and applicability to the enterprise business model. In addition, consideration would have to be given to reality inhibitors such as cost of the development, existing workforce skills and

limited time available to maintain and develop the E-Business operation (Figure 13). The ongoing inhibitors influenced how rapidly and effectively an enterprise developed its E-Business operation. Ongoing inhibitors were most likely to be reality barriers, such as finance and limited time available to divert to an E-Business operation. Such barriers could prove insurmountable especially in micro-sized SMEs with limited resources and create a ceiling to E-Business growth (Jones et al, 2003b).

Understanding the influence of such barriers, was critical to appreciate the nature of E-Business usage within the SME sector, which was considered within the research findings of this thesis presented within Chapters Six and Seven. Jones et al, (2003b) identified micro and small sized enterprise Owner/Managers were restricted by insufficient time and limited financial resources as the main factors constraining E-Business usage. By contrast, barriers to speed of E-Business development had less influence in medium and large sized SMEs. This evidence suggested that micro-sized SME Owner/Managers were finding it difficult to develop E-Business competency due to their limited levels of resources and skills, beyond a basic level of utilisation. Kendall et al, (2001b) found that Internet adoption was more effective where SME Owner/Managers recognised the business need and its strategic value to business competitiveness. This raised the question regarding the level of ongoing maintenance and evaluation of the E-Business function, which was occurring within SMEs.

A key issue in terms of effective E-Business deployment was the maintenance policy, most significantly for the enterprise website. If website content was regularly maintained (e.g. weekly), developed and updated, its usage would be likely to become of central importance to customers, employers and suppliers (Bell and Tang, 1998). Potter and Pickernell (2004) however, noted that only 38% of small and 53% of medium SMEs undertook regular website maintenance. A key issue connected to the lack of maintenance, was the deficiency of IT/IS skills within the SME employee workforce, due to the scarcity of training

provision. Potter and Pickernell (2004) identified that only half of SMEs were satisfied with their in-house IT skills expertise, and 34% provided formal training.

Similarly, the FSB (2006) survey reported 25% of enterprises provided no training whilst 39% was delivered by a staff member or self taught. The eCIC (2005) study revealed the most common method of E-Business training was for staff to self-teach, with 20% of micro and 24% of small sized SMEs utilising this prevalent method. Furthermore, 6% of micro enterprises identified no method of meeting staff IT/IS training needs. In contrast, 45% of medium sized SMEs (10-49 employees) delivered IS/IT training on an ad hoc or regular basis, with 18% providing outsourced training. Only 18% of medium sized enterprises relied on staff self-training. Another disturbing statistic was the number of SMEs reporting no necessity for IT/IS training (41% micro, 36% small, 18% medium).

These statistics suggested that SME Owner/Managers did not understand the benefits or the importance of IS/IT and therefore it was under resourced, in terms of staff training and ongoing maintenance provision. The effectiveness of utilising Owner/Managers or enterprise employees to undertake self-teaching or as self appointed trainers of IS/IT skills to improve E-Business remains questionable and unproven. Another failure of the SME sector, was the inability of Owner/Managers to measure the costs and benefits incurred from E-Business usage (DTI, 2004), where only 11% of SMEs decision makers undertook any formative evaluation to assess added value (eCIC, 2005). This lack of strategic evaluation can be closely related to the lack of formal strategic E-Business planning undertaken within the SME sector, with less than 5% of Owner/Manager identifying a formal process (Lewis and Cockrill, 2002; Potter and Pickernell, 2004; eCIC, 2005). This lack of planning was most prevalent within the micro and "Sole-Proprietor" sectors (NOP, 2000; eCIC, 2005).

Thus, the picture that emerged was of basic utilisation of E-Business technology, especially in the micro sized SME classifications. Higher

levels of organisational utilisation were restricted by several inhibitors, which delayed initial adoption and inhibited further growth. Figure 14 conceptualised the E-Business environment and the key influences therein: the individual SME was represented in the middle section of the diagram. Within the business environment of the SME, several facets were identified, namely the SME itself, the Owner/Manager and staff/employees. Also identified within the internal business environment, was the nature of the enterprise itself, including product/service, business/marketing strategy and current trading market (e.g. local, national, international). These factors potentially influenced the attitude of the enterprise towards E-Business adoption. For example, was IT/IS development in the enterprise considered within a generic business plan? How applicable was E-Business usage to the nature of the business operation and the trading market?

It was also necessary to consider the current level of IT/IS usage and its strategic implementation through a regimented planning strategy. This would consider the level of IT/IS investment undertaken and planned in the future, the maintenance policy and training schedule. In addition, the Owner/Manager should consider evaluation of IT/IS via a structured cost/benefit analysis exercise. Without consideration of such factors, the implementation and future success of E-Business was likely to be flawed and a potential failure. Also identified within the internal environment, were the reality inhibitors posited above. Such organisational deficiencies might inhibit the enterprise from developing its E-Business capability; and included finance, time and skills of employees. The effect of these inhibitors could be reduced by effective business planning and assistance from external bodies.

External bodies were identified in the left column of Figure 14, which represented agencies outside the enterprise that might influence, either positively or negatively, the adoption of E-Business. These include government departments and related bodies, the press/media, suppliers and customers. Government departments and related bodies include

funding agencies that might offer attractive incentives to develop E-Business competency. The accuracy of this conceptualisation of E-Business was reconsidered in light of the primary research undertaken within this thesis. Thus, it was apparent from the extant literature that SME Owner/Managers developed perceptions of the value and effectiveness of E-Business from a plurality of internal and external sources. These perceptions acted as preliminary and ongoing drivers, but also as inhibitors that might deter initial adoption. These perceptions impacted, in conjunction with the reality barriers that existed within the enterprise, to determine the initial and ongoing utilisation of E-Business.

3.10 The Research Questions

This section reappraised and refined the research questions identified in Section 1.0, in light of the literature review undertaken within this chapter. The central proposition of this thesis investigated SME Owner/Manager attitudes towards achieving business growth through the use of E-Business and within the context of "Sole-Proprietor" micro-sized SMEs. To examine this proposition, three research aims were identified, as stated within Section 1.0. To explore these aims, the following research questions were identified from the literature review, which informed the information gathering for the first research aim in particular.

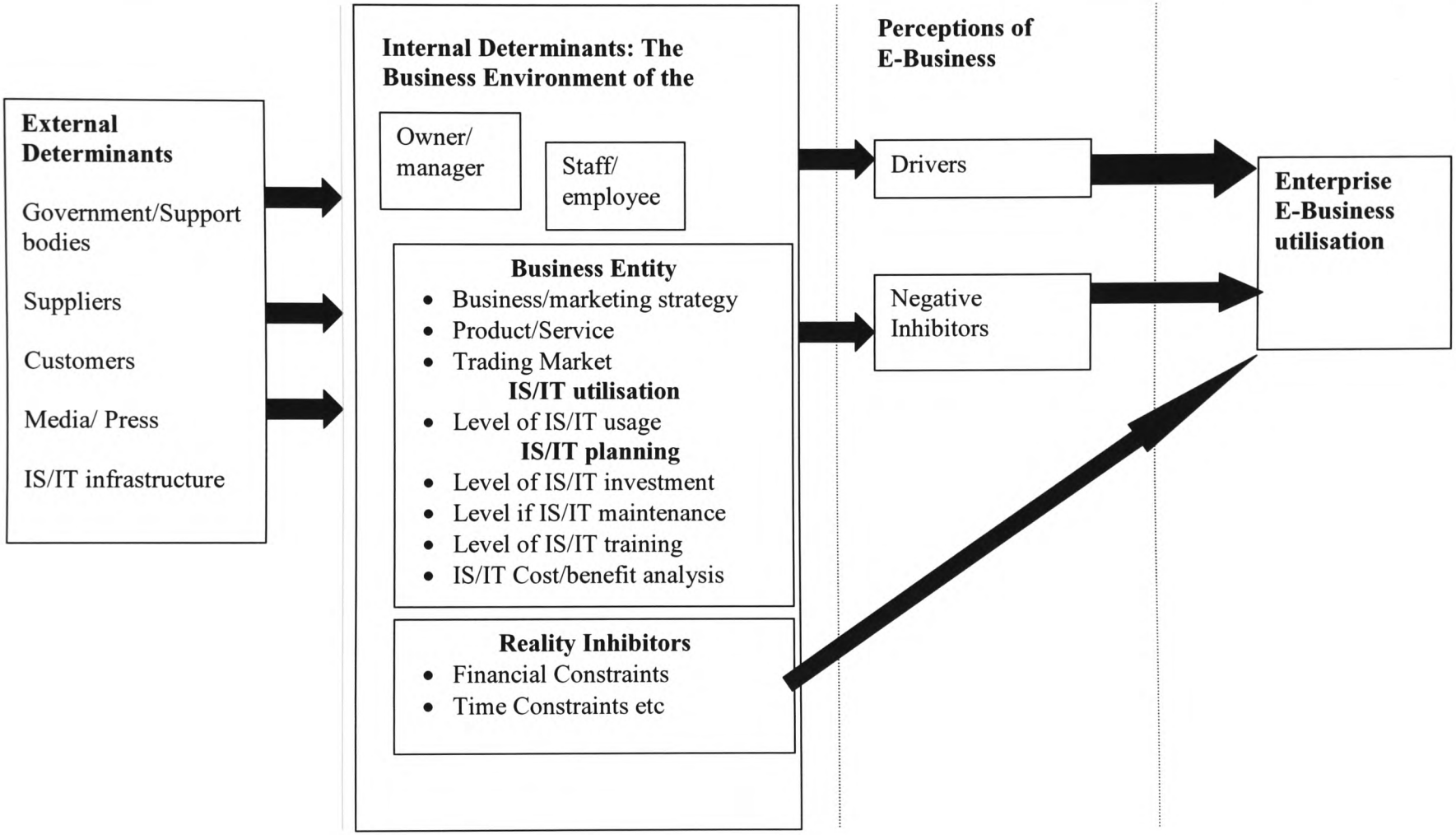
1. Identify and evaluate the key factors associated with E-Business adoption and usage within SMEs in Wales with particular reference to the "Sole-Proprietor" sized classification:-

    - What were the key inhibitors and drivers to E-Business utilisation within the SME sector?
    - How do SME Owner/Manager perceptions regarding E-Business influence adoption and utilisation?
    - Assess the extent of E-Business planning within the SME sector.

The evidence presented in Sections 3.5-3.6 and 3.9, suggested the existence of a number of inhibitors and drivers to E-Business growth existed in the SME sector. Such inhibitors have a significant impact on the micro-sized SME classifications, which were particularly prevalent within Wales. However, what remained uncertain was whether such barriers created a ceiling on E-Business usage and whether Owner/Managers were content to attain certain levels of E-Business functionality, but not actively pursue growth. Further empirical evidence was required to support the proposition posited within Jones et al (2003b), regarding the existence of initial and ongoing inhibitors to growth. Similarly, the literature recognised the existence of drivers in the form of Owner/Manager perceptions that encouraged E-Business utilisation and participation.

Further evidence was required to evaluate their impact upon the Owner/Manager as a positive enabler of E-Business adoption. Finally, the literature supported the importance of strategic deployment of the E-Business function to achieve maximum effectiveness. Evidence suggested, however, that planning of the E-Business function within the SME sector was limited. Again, further evidence was required to explore this key facet of E-Business deployment. In summary, the investigation of key inhibitors, drivers, perceptions and effectiveness of E-Business planning represented the key factors influencing the effectiveness of E-Business adoption and usage. These issues were explored in the following chapters and provided evidence towards the fulfilment of the research aim.

Figure 14: Conceptualisation Framework of the Adoption of E-Business within the SME community



2. Critically evaluate and contrast the usage of E-Business within micro-sized "Sole-Proprietor" SMEs against other SME size classifications to understand the issues faced.

As outlined in Section 1.0 in depth investigation of the literature confirmed a limited narrative exploring the deployment of E-Business within micro-sized "Sole-Proprietor" SMEs despite their considerable significant in terms of population within the small business community. Further evidence was required to investigate the effectiveness of E-Business deployment in comparison with other sections of the SME community.

3. Develop a conceptual model illustrating the key actors and micro and macro relationships within the E-Business environment for the micro-sized "Sole-Proprietor" SME classified enterprises from the perspective of the Owner/Manager.

This research aim drew the key elements of the research together and conceptualised the E-Business environment for the micro-sized "Sole-Proprietor" SME classified enterprise. This conceptualisation clarified the process of adoption and usage of E-Business within this SME community, highlighting the key actors and internal and external relationships involved.

3.11 Summary

Within this chapter, a conceptual framework (Figure 14) was mooted based on the literature to conceptualise the usage of E-Business within the SME sector. A review on existing literature revealed that examples of successful E-Business exploitation in the SME community remained the exception rather than the rule, especially within the micro-sized enterprises in a regional context. This chapter established the importance of the SME Owner/Manager, as a key decision maker and determinant of successful E-Business exploitation within the SME. There remained a

dearth of knowledge regarding the processes and motivations of the SME Owner/Manager, in their appraisal of the variables, to utilise E-Business. Chapters Five and Six provided further data to evaluate the effectiveness of SME deployment of E-Business technologies with particular focus on the micro-sized SME classifications. The following chapter considered the methodology deployed to investigate the research questions.

Chapter 4:

Research design and Methodology

Chapter 4: Research Design and Methodology

This chapter identified and justified the selection of the appropriate research methods to fulfil the aims of this study, drawing on the extant literature of SMEs' E-Business usage discussed within Chapters Two and Three. This chapter was organised into five parts. Firstly, this chapter considered the research philosophy underpinning the study. Secondly, the central aims of this thesis were revisited, to establish the most appropriate methods for achieving valid and reliable results. Thereafter, the research design deployed within this study was considered, outlining the principal methods employed, namely a quantitative survey through questionnaire and longitudinal case studies. Thirdly, the analysis of the results process was explained for the research methods deployed. Fourthly, the chapter considered the issues of sampling, ethics and confidentiality. Lastly, the chapter analysed the response rates achieved within the quantitative survey. The next section considered the research philosophy underpinning this study.

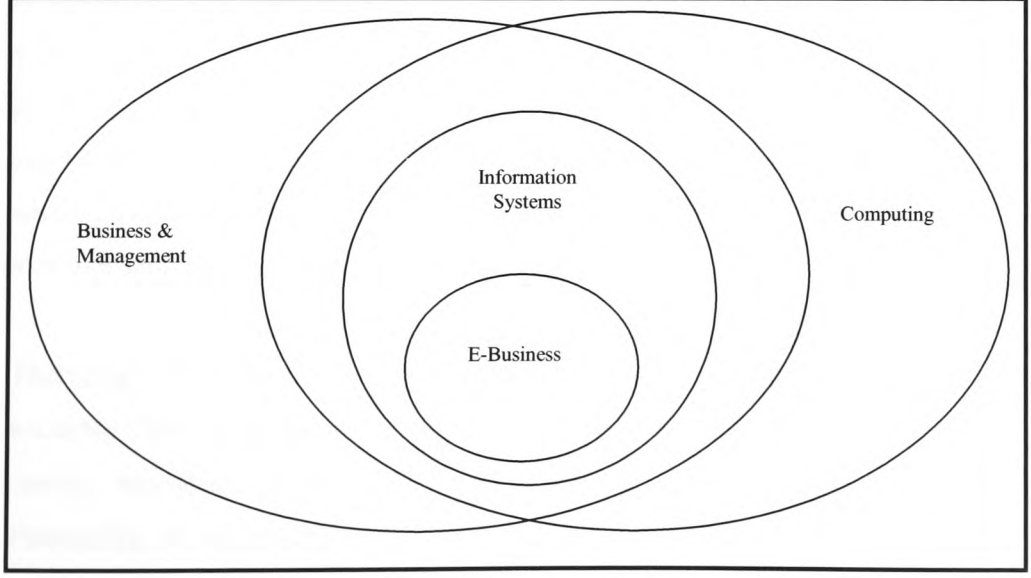
4.1 Research Philosophy

Chapters Two and Three examined literature from both E-Business and enterprise disciplines. By way of introduction, this section considered the nature of E-Business research. Remenyi et al, (1998) identified that business and management research was still a relatively new phenomenon. The research area of E-Business emerged during the 1990s and was generally considered as a subset of the general areas of business, management and computing (Figure 15). E-Business has evolved from the field of information systems (IS) and can still be considered evolutionary in nature (Mahajan and Venkatesh, 2000; Kehoe and Broughton, 2001).

IS gained prominence in the mid 1970s, with the increasing utilisation of IT within the public and private sector (Brynjolfsson and Yang, 1996; Brynjolfsson and Hitt, 2000). During the 1980s, a significant

body of IT/IS literature was published, evaluating the impact of technology within the enterprise, utilising a variety of research methods, including case studies (Kling and Iacono, 1984; George and McKeown, 1985; Benbasat et al, 1987) and ethnographic studies (Belk et al, 1988). Reference to E-Business first appeared in the 1990s, with the emergence of the Internet and its usage for business purposes (Paper et al, 2003). During the 1990s, several studies investigated the phenomenon of Internet usage within organisations, especially small businesses (Abell and Lim, 1996; Lederer et al, 1996; Fink et al, 1997). Initially, these studies were positivistic and large scale, designed to rank general usage patterns of the Internet (Greaves et al, 1999). In recent years, a more extensive range of research methodologies have been utilised (Grant and Fitzgerald, 2005), including increased use of qualitative methods (Elliot, 2002; Chuang and Shaw, 2005) and the emergence of multiple method studies (Lane and Stolting 2005; Lefebvre et al, 2005), to report the phenomenon of E-Business usage.

Figure 15: Conceptualisation of E-Business research area



The origin of models tracking E-Business development can be traced to Nolan's (1979) SoGM for IT/IS and Churchill and Lewis (1983) framework for enterprise growth, as discussed within the literature

review (Section 2.7.1-2.7.2) (Cragg and King, 1993; Terpstra and Olsen, 1993). In terms of ontology, it was necessary to consider how SME Owner/Manager viewed the world and their perception of reality (Hill and Tiu Wright, 2001). Creswell (1994) and Hill and Tiu Wright (2001) determined that multiple realities existed in any given situation and included those of the researcher, the individuals under investigation or the audience interpreting a study as was apparent within E-Business usage in the SME sector.

The perception, knowledge and understanding of E-Business was formed through the interaction of the SME Owner/Manager with IT through acquired experience from usage which could be both positive and negative, and knowledge acquisition from a diversity of sources including peer, employees, customers, academia, enterprise support bodies and the media. This was a subjective, individual experience, and its effectiveness was dependent on the abilities and attitudes of the Owner/Manager and the suitability of E-Business for the enterprise in question. Thus, the ontology of E-Business within the SME sector was a complex and evolving phenomenon with a multitude of influences and antecedents. Therefore, it was apparent that knowledge sources of E-Business were informed from both interpretivist and positivist approaches. Typically, such knowledge was incomplete and did not encompass all perspectives, thus providing unrealistic or incorrect attitudes and a flawed reality.

Therefore, this study embraced the concept of multiple realities, and accepted that individual SME Owner/Manager, constructed their own reality, according to how they interpreted and perceived the world. Personally, at the outset of this study, and as a novice researcher, the author had no pre-conceived preferences or perceptions regarding their ontological position. This emerged after consideration of the extant literature and the formulation of the boundaries of the research project identified within Chapters Two and Three. The basis for the methodological selection was the known epistemological knowledge

from relevant sources, identified previously in section 1.0, regarding E-Business usage within SMEs. Having undertaken a thorough literature review, it was apparent that to understand E-Business behaviour within the SME, a comprehensive and robust methodology was required, potentially encompassing a range of methods.

4.2 Aim of the Study

The thesis introduced the aims of the study in Chapter One. These were considered in context with the research methods deployed, namely:-

1. Identify and evaluate the key factors associated with E-Business adoption and usage within SMEs in Wales.
2. Critically evaluate and contrast the usage of E-Business within micro-sized "Sole-Proprietor" SMEs against other SME size classifications to understand the issues faced.
3. The development of a conceptual model illustrating the key actors and micro and macro relationships within the E-Business environment for the micro-sized "Sole-Proprietor" SME classified enterprises from the perspective of the Owner/Manager.

The ontological position of this thesis recognised that SME Owner/Managers had attitudes, perceptions and understanding, which influenced the perceived knowledge of E-Business within the social world. The assumption was made that E-Business practices within SMEs existed and it was possible to classify, measure and group these activities. This study did not consider the psychological makeup of the SME Owner/Managers but focused instead on the attitudes, understanding and knowledge exhibited towards E-Business usage. Furthermore, there was an appreciation that the relationships between the relevant E-Business variables were explored, in order to understand the nature of its usage. SME Owners/Managers acquired and applied this knowledge from a variety of sources (e.g. the media, enterprise support bodies, the Internet

and through personal research), to develop their utilisation of E-Business technologies.

Mason (2002) concluded that the epistemological question should direct the researcher to a consideration of the issues involved in the research question. Within this thesis, the epistemological position was informed from a diversity of sources. The concept was summarised within Figure One, including public and private sector bodies, the media, academia and SMEs' key stakeholders, as established within the literature in Chapters Two and Three. The next section described the research design deployed to attain this aim.

4.3 Research Design

This thesis was concerned with E-Business usage within SMEs, with particular focus on micro-sized enterprises. This was a complex phenomena requiring investigation into a plethora of factors associated with E-Business usage. Yin (1994) discovered there was a need to construct a research design, which enabled the data collected to be connected to the topics contained within the thesis, so that meaningful conclusions could be extracted. Jankowicz concluded that a research method was:-

> *"...a systematic and orderly approach taken towards the collection and analysis of data so that information can be obtained from these data."*
>
> (2000: 209)

Examination of existing E-Business studies revealed a multiplicity of potential techniques, including inductive, deductive, experimental, case study, cross-sectional or longitudinal approaches (Jankowicz, 2000; Gray, 2004b). Jankowicz (2000) noted the selection of appropriate methods and techniques was dependent on the nature of the research problem. Researchers faced the choice of achieving the appropriate balance between positivist and phenomenological techniques. There

remained ongoing debate within management research regarding the predominance and popularity of quantitative techniques (Brownell and Trotman, 1988; Johnson and Duberley, 2000). Johnson and Duberley (2000) argued the necessity for interpretative approaches. Jones-Evans (1994) suggested that quantitative studies did not provide a researcher with the required data richness on which a theory was constructed, regarding why and how certain phenomena occurred.

Gould (1988) and Brewer and Hunter (1989) determined that the use of statistical techniques within quantitative methods, provided only a record of measurements of a phenomenon within a population, whilst Bryman (1993), argued that qualitative approaches were concerned with emergent themes and idiographic descriptions, rather than a static analysis of the relationships between variables. Tesch (1990) summarised this succinctly, suggesting positivists employed words as data, whilst qualitative researchers used numbers to identify patterns in human activity. Blau and Scott (1963) supported the use of large-scale quantitative studies, arguing that they allowed knowledge of organisational phenomena to be expanded. In contrast, Strauss and Corbin (1990) argued for the use of qualitative research methods, as opposed to quantitative, to create better understanding of phenomena, whilst, Hoepfl (1997) suggested qualitative methods would be a prerequisite to identifying the variables that might be later tested quantitatively.

The prior quantitative surveys, investigating the levels of E-Business usage within the SME sector, provided knowledge of the factors involved within the phenomena (NOP, 2000; eCIC, 2003; eCIC, 2004; eCIC, 2005). Several aspects of these studies can be criticised, in terms of their representation of the SME sector (Section 3.8). Moreover, given the evidence of increased take up of Internet related technologies, there was a need to constantly update and review progress from multiple perspectives. Therefore, it was considered necessary to verify the factors involved within SME E-Business usage through a quantitative survey.

This contrasted with Hoepfl's (1997) findings, on the basis that E-Business usage was a known phenomenon, yet the relationships between the factors lacked clarification.

The rich holistic understanding of the nature and inter-relationship of these factors could only be provided, by undertaking detailed qualitative investigation (Debreceny et al, 2002). Swartz and Boaden (1997) supported this strategy, arguing that quantitative methods alone could not indicate the richness of social phenomena and the necessity to combine methods utilising quantitative data, to provide patterns and structure, and qualitative methods to enable understanding of the relationships within these patterns, was the optimal solution. Furthermore, Swartz and Boaden (1997) argued that it was only by investigating the research hypotheses in the environment of the enterprise, could the complexity of the phenomena be understood. Thus, the selection of multiple methods was due to the complexity of the phenomena of E-Business usage, and the necessity to accurately portray the reality of usage within the SME sector, considered within the following section.

4.4 Use of Multiple Methods

Denzin (1970) and Amaratunga et al, (2002) described methodological triangulation as the combination of methodologies in the study of the same phenomenon. Multiple method studies enabled methodological triangulation to be utilised, whereby several methods of data collection were employed to take advantage of their respective qualities (Easterby-Smith et al, 1991; Mingers, 2001; Thietart et al, 2001; Partington, 2002). Mingers (2003) revealed that multi-method research remained relatively scarce with philosophy, culture, psychology and practice providing significant barriers to its widespread usage, despite advocates within the academic community (Galliers, 1994). Fielding and Fielding (1986), Gable (1994) and Debreceny et al, (2002) supported the use of quantitative and qualitative methods within an individual study and provided examples of its successful implementation.

Sieber (1973) and Gill and Johnson (1997) suggested various reasons to combine methods, including quantitative data, being able to assist with the qualitative side of a study; during design by locating a representative sample and deviant cases, during the data collection phase, by providing background data and avoiding bias, and finally, at the analysis stage, quantitative data assisted by demonstrating the generality of specific observations and providing supporting data for qualitative observations. Conversely, qualitative data assisted the quantitative part of a study during design, by aiding conceptual development, through access to assisting the data collection process and during analysis, can aid the validation and interpretation of quantitative findings (Jayaratne, 1993). Mingers (2003) and Johnsen et al, (2006) further supported this argument, stressing the richness, increased validity and credibility of results. Bryman (1993) and Gray (2004b) provided the optimum definition, by noting that the prime reason for combining the methods was to capitalise on the strengths of the two approaches and compensated for the weaknesses of each approach.

The literature suggested that the use of methodological triangulation offered several advantages. Hussey and Hussey (2003) identified that methodological triangulation could overcome the potential bias or sterility of a single method approach. Whilst Denzin (1970) suggested that methodological triangulation led to greater validity and reliability than a single method approach. The combination of qualitative and quantitative methods had been widely previously employed and recognised as complementary within other business disciplines (Ghauri and Grønhaug, 2002; Robson, 2002) and a mechanism to corroborate the various approaches (Mason, 2002). Miles and Huberman (1994) stated that the issue was not, whether, qualitative and quantitative data could be methodologically linked, but establishing how and for what purpose. In terms of how to integrate multiple methods, several factors required consideration.

Mason (2002) identified integration at technical, ontological, knowledge and evidence explanation levels. Technical integration was achieved through utilisation of SME data from the quantitative survey and a selection of qualitative case studies from the large survey. Ontological integration was achieved, as the data from both methods was consistent and complementary, whereby the quantitative survey identified the trends and instances of E-Business within SMEs, whereas the case studies recognised the causes and influences of these factors. Both methods emanated from the same consistent epistemological assumptions (Section 4.2), in that each produced legitimate and adequate knowledge, which contributed equally to understanding the phenomenon under study (Tashakkori and Teddlie, 1998; Gray, 2004a).

The quantitative and qualitative techniques contributed critical data to create a coherent integration of both sources. Jayaratne (1993) and Amaratunga et al, (2002) concluded that qualitative data was useful when supplementing, supporting, validating, explaining, illuminating or re-interpreting quantitative data gathered from the same source, as occurred within this study. Figure One provided an overview of the mixed methods approach deployed within this study with, the quantitative survey outlining a profile of SME E-Business adoption, whilst the qualitative data stated the rich picture of how and why enterprises progressed their usage.

Previous studies of SME usage of IT/IS (Swartz and Boaden, 1997; Lawson et al, 2003) and E-Business (Barry and Milner, 2002; Ramsey et al, 2003), utilised a mixed methods triangulation policy. Within this thesis, the quantitative study was undertaken first and the qualitative case study analysis second, as suggested in Bryman (1993) and demonstrated within Elsammani et al, (2001). The rationale for this approach was for the quantitative survey to inform the thesis in terms of the profile of E-Business adopters and identify the key factors and, thereafter, the qualitative study to explore these issues in-depth. The quantitative survey identified key trends in E-Business usage, whilst the case studies

revealed the rich data underpinning reasons for deployment. Creswell (1994) supported this design approach, which was described as a sequential explanatory strategy study. Section 4.6, through to Section 4.11, described the design of the quantitative survey. Thereafter, from Section 4.12, through to Section 4.16, the case study methodology was analysed. Figure One highlighted the contribution made by each research method towards each area of enquiry within the thesis.

4.5 Rationale for Quantitative Survey

The survey comprised a questionnaire analysis of SMEs' usage of E-Business technologies. This method enabled the thesis to answer the first objective of this thesis, namely to gauge the trends and uptake of specific technologies. The use of quantitative surveys was recognised as a rapid and inexpensive method of discovering the characteristics and beliefs of a population through a representative sample (Jankowicz, 2000), and was widely utilised by government, academia and the private sector (May, 2001). Previously, surveys have been widely used in measuring the levels of E-Business and E-Commerce within the UK (Section 3.8.2).

4.6 Survey Design Quantitative Study

The quantitative survey presented several issues that had to be addressed in terms of geographical coverage, sampling and selection of SMEs, delivery method and survey constraints, which were considered in turn. The selection of enterprises for both the quantitative and qualitative elements of this study, involved identifying a verifiable sample process. Hair et al, (2003) proposed a structure for obtaining a sample process, as defining the target population, selection of the sampling frame and method, determining the sample size and the implementation of the sample plan. The target population was defined as the complete group of objects of elements for this study, which contained the information that the research project was designed to collect. Hair et al, (2003) acknowledged influences on this selection as: knowledge of the topic,

access to elements, their availability and time frame. Within this thesis, the objects under investigation were the SME community within Wales.

4.6.1 Survey population quantitative study

The total population of SMEs within Wales was identified as approximately 144,000 (Table 4, Section 2.2) whilst Section 2.3 stated the importance of SMEs to the Welsh economy and its ongoing prosperity. Therefore, it was recognised there was a need to undertake a representative quantitative survey of SMEs, in terms of their geographical location and enterprise size. Hair et al, (2003) supported an ad hoc selection method, based on previous studies and cost implications. A target of 500 SME classified enterprises was identified for the survey, thus providing sufficient size and quality to yield credible results in terms of accuracy and consistency. This target was identified from analysing previous surveys investigating E-Business usage within Wales (Chapter Three).

Of the 18 considered surveys (Section 3.8) only seven comprised a significant sample size in excess of 500 respondents. It was recognised that there was necessity to add to this knowledge body and undertake a survey with a significant and representative sample. Setting a target of 500 enterprises meant that this would be the third largest survey undertaken investigating E-Business in Wales, thus providing credible findings that were contrasted against other surveys. Having identified the survey population, it was necessary to select a sampling frame. The sampling frame represented the elements from which the sample was drawn (Hair et al, 2003). The sampling frame was a complex issue and, in this instance, considered geographical coverage and SME size and IA.

4.6.2 Geographical coverage quantitative study

Storey (1997) noted that regional differences within SMEs were explained in terms of sector composition. Packham (2001) and

MacGregor (2003) argued that to reduce this variance, studies should focus on a particular region. Given that the author was employed within Wales, first within a Further Education (FE) college and thereafter a Welsh University, it was the natural conclusion to give the study a Welsh context, due to the enterprise accessibility issues. It was recognised, that to achieve a representative survey of SMEs, it was necessary to collect data representing the geographical and economic diversity of enterprises throughout Wales. Consequently, Wales was categorised into regions described as unitary authorities (UAs), which were nationally recognised categorisations as utilised within the NOP (2000) survey. The selected authorities (Table 13) represented the diverse geographical and economic regions within Wales, e.g. urban (e.g. Swansea), rural areas (e.g. Carmarthenshire), areas of high unemployment and social deprivation (e.g. BG) (Palvia and Palvia, 1999; NOP, 2000). A target sample was selected to provide a proportional representation of the SME community by LA as identified within SBS (2004). These results were discussed throughout Chapter Five.

Table 13: Unitary Authorities within Survey

Region Number	Authority
1	Blaenau Gwent
2	Bridgend
3	Caerphilly
4	Cardiff
5	Carmarthenshire
6	Ceredigion
7	Merthyr Tydfil
8	Neath and Port Talbot
9	Newport
10	Pembrokeshire
11	Rhondda Cynon Taf
12	Swansea
13	Torfaen
14	Vale of Glamorgan

4.6.3 Industry activity coverage

It was important to select a representative population of survey respondents, by IA (NOP, 2000; DTI, 2004; eCIC, 2005) enabling

comparison with other regional, national and UK studies. Table 14 identified the industry sector classifications deployed within the study, which reflected the standard industry classification (SIC) system (SBS, 2004). These classifications were utilised within the survey instrument, as identified within Appendix B and as a base comparator throughout Chapter Five.

Table 14: Industry Sector Classification
Agriculture/Forestry/Fishing
Mining/Quarrying
Construction
Manufacturing
Communications/Computing
Wholesaler
Retail/Repair
Finance/Insurance/Real Estate/Legal
Services/Transport
Education
Health/Medical
Other

4.6.4 Selection of SMEs for quantitative study

Having selected the regions of investigation for the survey, it was necessary to identify the method required to contact individual SMEs. Several potential sources of information for SMEs in Wales, including paper-based and electronic format, were identified and evaluated (Table 15). The selection of source data for SMEs was based on multiple criteria, namely cost, accuracy and geographical coverage. A number of sources, including private company databases and Companies House were discounted due to access cost. The author of this thesis paid the quantitative survey costs. Further sources, such as Yellow Pages and Thompson local directory, were discounted, due to their inability to identify SME-sized classified enterprises (Mustaffa and Beaumont, 2002). The optimum solution was identified as UAs' SME directories (Al-Qirim and Corbitt, 2001).

Table 15: Information Sources for SMEs in Wales

Source	Form	Advantages	Disadvantages
Yellow Pages	Paper	• Free • Catalogued and sectioned	• Proprietor unidentified • No SME recognised classification
Thompson Local Directory	Paper	• Free • Catalogued and sectioned	• Proprietor unidentified • No SME recognised classification
Private Company databases	Website and Paper	• Customised SME data	• Expensive • Questionable data validity
Unitary Authorities SME directories	Website or paper	• Free • Proprietor identified • SMEs identified by size and industry.	• Some directories' data obsolete
Companies House, Cardiff	Website or paper	• Catalogued and sectioned • Customised SME data Proprietor identified	• Fee involved • VAT registered SMEs only

All the selected authorities (Table 13) operated a directory, listing SMEs within their geographical boundaries, in either paper-based or website format. The accuracy of content of the directories varied significantly. However, they still held several advantages over other sources, in that they included only SME-sized classified enterprises, and typically contained individual enterprise details on, full postal and telephone address, industrial sector, nature of the IA, proprietor name and were free of charge. The variance in age of the directories was potentially significant, due to the number of SMEs in Wales that fail, thus making significant quantities of data obsolete (SBS, 2005b). This data inaccuracy was potentially exacerbated by enterprises changing their location or business name. Therefore, to compensate, it was decided that all other available sources would be utilised, including the Thompson and Yellow Pages, to both complement and verify the UA directories and

confirm the existence of an enterprise and its contact information (e.g. Owner/Manager name and title, telephone and address). This decision proved an effective method of improving data accuracy of the data collected.

4.6.5 Sample method employed within quantitative survey

The survey deployed a proportionately stratified and representative sampling technique, whereby two-thirds of the enterprises selected were "Sole-Proprietor" size classified to ensure compatibility with the SME sized population (Easterby-Smith et al, 1991; Mason, 2002). SMEs were selected through a simple random sampling technique, with every third SME being targeted within the business directories from UAs throughout Wales, in direct proportion to their size classification (De Vaus, 2002; Cooper and Schindler, 2003; Bryman, 2004).

4.7 Data Collection Methodology

Jobber (1991) suggested that a key issue in management research was the selection of the most appropriate survey collection method. To resolve this issue, it was essential to appraise all methods, and select the most appropriate to answer the research questions and objectives identified in section 1.0 (Saunders et al, 2006). The survey utilised both self-completion and interview techniques. One self-completion technique was deployed, namely mailed questionnaires. In addition, two interview methods were utilised in the form of personal interview and telephone questionnaire. Use of an online questionnaire was considered, but discounted, as it would bias the sample towards enterprises with a significant technological presence.

The rationale for selection of the three methods was to ensure that the survey was completed, given the time and cost constraints on the thesis and the need to capture enterprise data from a wide geographical area (Chong, 2004). All the methods deployed were recognised within the

literature as valid methods of data delivery (Saunders et al, 2006). Indeed, several prior studies of E-Business usage in SMEs have utilised combined data collection methods, including Lindgren's (2001), use of postal and telephone questionnaires and Kendall et al, (2001a) utilising fax, E-mail and postal delivery.

The literature identified known advantages and disadvantages for each collection method. Postal questionnaires were identified as cost effective, with a low cost of data collection and processing potential for wide geographical coverage and avoidance of interviewer bias (Hoyle et al, 2002; Hair et al, 2003). Postal questionnaires were considered as having low response rates (40% being considered high, Gray, 2004b), were unsuitable for specific needs and the interviewer had minimal control over completion of the questionnaire, resulting in potential misunderstandings (Oppenheim, 1992; Sekaran, 2000). These issues were addressed within 4.8.1. Face-to-face interviews were recognised as having higher response rates, were suitable for specific needs and, due to the interviewers' presence, there was the opportunity to control and ensure the successful and accurate completion of the questionnaire (Jobber, 1991; Oppenheim, 1992; Sekaran, 2000; Hoyle et al, 2002).

Disadvantages of this delivery method included cost and time issues and the risk of interviewer bias (Oppenheim, 1992; Sekaran, 2000; Cooper and Schindler, 2003). These issues were addressed in Section 4.8.3. Similarly, telephone interviews were known to be cost and time effective, with wide geographical coverage and removed the necessity for face-to-face meetings, with good response rates (Oppenheim, 1992; Sekaran, 2000; Hoyle et al, 2002; Robson, 2002). Disadvantages included the lack of non-verbal communication, the negative impact of telemarketing and the fact that the respondent could terminate conversation at any point (Sekaran, 2000; Jobber, 2001) which was addressed in Section 4.8.2.

The combined usage of several data collection methods was previously reported in Jobber (1991), Dillman (2000) and Koh and Maguire (2004), although the necessity for a common questionnaire design for each method was stressed. The survey was delivered over a six-month period, with a target of 500 respondents comprised of 140 postal, 180 face-to-face interview and 180 telephone methods. The rationale for this return was cost, time, comparison with surveys previously undertaken in Wales (Remenyi et al, 1998; Lehmann, 1989) and to provide a balanced response from all methods.

To achieve this, a target of 15 enterprises, by either telephone or face-to-face interview method, per week, for 24 weeks was identified. Concurrently with this process, a monthly postal survey was undertaken to achieve the identified postal response target. Appendix C charted the data collection strategy employed over the duration of the study. The same research instrument was employed in each of the data collection methods; as verified from the pilot surveys (Section 4.9) with no significant anomalies identified. A detailed description of each method was reported within the following sections.

4.7.1 Postal

This method enabled a large potential return, with extensive coverage at an achievable cost (May, 2001), and had seen widespread deployment in prior SME E-Business studies (Daniel et al, 2001; Meir et al, 2001; Daniel, 2003; Lawson et al, 2003; Prananto et al, 2004; Karakostas et al, 2005). This method provided the significant advantage of allowing the respondents to complete the questionnaire in their own time, without interviewer influence (Remenyi et al, 1998). Each month, a group of, typically 100 plus SMEs were identified for the postal survey from a particular UA, utilising a business directory.

Every survey participant was sent a covering letter addressed to the Owner/Manager, including a University of Glamorgan letterhead as

generally proposed within, Jankowicz (2000), Ibert et al, (2001), De Vaus (2002), Cooper and Schindler, (2003) and Bryman (2004) (Appendix A), a numbered questionnaire (Appendix B) and a return stamped and addressed envelope within a professionally presented envelope (Chen and Williams, 1998; Frankfort-Nachmias and Nachmias, 1996; Palvia and Palvia, 1999; Thietart et al, 2001; Saunders et al, 2006). A covering letter explained the purpose of the questionnaire, assured the respondent of the motivations for the research and contained statements of confidentiality and anonymity, as recommended in, Teo and Tan (1998), Jankowicz (2000), Kendall et al, (2001b) and Saunders et al, (2006).

Each questionnaire was numbered, to ensure each enterprise could be individually identified and any omitted detail, such as size classification or sector, added by reference to a SME database. The database contained a record of every SMEs surveyed with details of all returned questionnaires. As questionnaires were returned, the database was updated to identify respondent enterprises. Upon every envelope delivered, a return address was identified. The rationale being to ensure return of the letter, where the business had moved or stopped trading (Palvia and Palvia, 1999; De Vaus, 2002), to reduce costs (in terms of reusable return envelopes) and to validate the actual survey response data. Given the large number of questionnaires that were returned unopened, as confirmed within Kaynak et al, (2005), it was decided not to undertake follow-up surveys with non-responding enterprises, due to the costs involved and likelihood of further failure and minimal return.

The likelihood of a low survey response rate was recognised, due to the aforementioned tendency of redundant enterprise data and respondent reluctance to participate. As noted within Section 4.7, a target figure for postal returns was identified. This target was achieved by undertaking a monthly survey of selected enterprises within different UAs. Appendix C, identified the postal surveys undertaken and response rates achieved. Contact details were included on the questionnaire in case of any queries

regarding its completion. All questionnaires, were delivered through second-class mail and sent out in batches on a weekly basis (Gillham, 2000).

4.7.2 Telephone

Telephone interviews were noted as a minimal cost, convenient method, in terms of access, speed and expenditure of interviewing, which could obtain information rapidly (Oppenheim, 1992; Remenyi et al, 1998; May, 2001; Cooper and Schindler, 2003; Hair et al, 2003; Saunders et al, 2006). Remenyi et al, (1998) reported the response rates for telephone interviews as typically ranging from 35%-75%. Subsequently, survey participants from UAs were identified and a weekly target of respondents targeted (Robson, 2002). A disadvantage of this method was the number of incorrect or non-functioning telephone numbers, caused by inaccurate data, business relocation or even liquidation (Cooper and Schindler, 2003). This issue was overcome, by calling alternative numbers from UA directories. An additional disadvantage of this method was the limitation on interview length, with no more than 20 minutes considered the ideal to complete the questionnaire (Remenyi et al, 1998; Jobber, 2001).

Consequently, the duration of each telephone call was managed on a case-by-case basis, depending on the level of E-Business usage within each enterprise contacted. The average telephone call lasted no more than ten minutes, with the longest taking 20 minutes. During each interview, there was a need for the interviewer to introduce himself and explain the purpose of the research. During each telephone interview, care was taken to establish the respondent's ability and willingness to complete the questionnaire at that time. If the respondent was unwilling to participate in the survey, then the interview was terminated. Alternatively, if the time was inconvenient, alternative arrangements were proposed.

One afternoon a week was allocated to meet this target. SMEs were contacted in turn and details of each telephone call recorded in a weekly log. The questionnaire was delivered in a structured interview, with questions being read out in a consistent tone of voice, so as not to influence or bias responses (Gray, 2004b). The questionnaire content was presented in Section 4.10. Confidentiality and anonymity of the respondent were assured and reinforced, through a postal statement if requested; Section 4.17 addressed these issues in more depth. With prior agreement, the cost of this exercise was borne by the researcher's employee. Whenever calls were made, the reasons for non-response were recorded on a response sheet (Gray, 2004b). Use of the telephone as a survey data collection were recognised as a valid data collection method in several prior SMEs E-Business and IT/IS studies such as, Riemenschneider and Mykytyn (2000), Sadowski et al, (2002), Matlay and Addis (2003) and Levy et al, (2004).

4.7.3 Face-to-face interview

This method required a face-to face opportunistic interview between the interviewer and respondent, utilising a structured questionnaire, whereby the respondent was asked a series of pre-established questions with preset response categories (Punch, 1998; Fink and Disterer, 2006). Dillman (2000) and May (2001) identified that this method yielded a high response rate, at an excessive cost, with control over the interview situation. Business parks were targeted in different UAs, as were centres of population such as, Llanelli, Swansea, Cardiff and Pontypridd. This was done because of the large number of enterprises that were accessible in small geographical areas. Thus, a number of enterprises were visited in a short time period, usually on foot. Such a strategy enabled more visits to "Sole-Proprietor" type SMEs, which did not advertise in UA directories. Moreover, this method enabled the clear identification of the most appropriate individual within the enterprise to complete the questionnaire through direct questioning at the outset of the interview. To ensure consistency of completion, assistance to respondents was only

provided when required. This assistance typically took the form of further explanation of questions.

4.7.4 Method flexibility

Greater flexibility developed between the different research methods as the researcher gained confidence and experience. For example, where an enterprise's Owner/Manager could not complete a telephone questionnaire a postal questionnaire was sent addressed to the Owner/Manager. Similarly, if an enterprise claimed it was too busy to complete a personal interview, then a postal questionnaire was offered to the Owner/Manager as an alternative. This increased survey flexibility, although not guaranteed to be successful, increased the likelihood of enterprise decision makers completing and returning the questionnaire.

4.8 Survey Constraints

The completion of the survey was restricted by several constraints, including time and cost, which were considered in the following sections.

4.8.1 Time

The employment as a full-time lecturer of the thesis author meant limited time was a significant constraint on the completion of the survey. One afternoon a week was allocated as dedicated time for the organisation and completion of the survey. A key impact of this constraint was the decision not to undertake a follow-up strategy, for non-respondents of the initial survey as the further time required for such a practice was not available and not cost effective (Cooper and Schindler, 2003). This factor, had implications for the design of the data collection method and geographical coverage of the survey, which were considered in the following section.

4.8.2 Cost

Another important constraint in the design of the survey methodology was cost. The majority of the cost of the survey was borne by the author, despite attempts to achieve further funding from grant awarding bodies such as local government. The exception was that the author was permitted to undertake telephone interviews at the workplace. Cost was a critical factor for the postal delivery method employed. This cost was considerable, when considering that to send a postal questionnaire to 100 SMEs required 200-second class stamps, costing in excess of £40. As a result, a monthly quota was set to budget the postal delivery method at 100 SMEs a month.

Other costs included items such as fuel when visiting SMEs, paper, electricity, telephone and computer facilities for the production and recording of questionnaires. Travelling to enterprise parks, where a large number of SMEs could be accessed with minimum further travel expenditure reduced the fuel cost. Furthermore, visits to enterprises and business parks were integrated into employment related travel and interviews with dissertation supervisors at both Glamorgan and Swansea University. Another cost, involved the purchase of Thompson Business Directories to provide support information on SMEs, which resulted in a single outlay of £26.

4.9 Piloting the Questionnaire

To verify the design of the questionnaire, two pilot studies were undertaken, firstly, to field test the structure and comprehension of the research instrument and, secondly, to evaluate the effectiveness of the data collection methods, as noted by Oppenheim (1992) and Babbie (1998). Previously, King et al, (2000) had undertaken multiple pilots to verify their research instrument and data collection strategy. Oppenheim (1992), Bell (1999), Gillham (2000), Jankowicz (2000), Daymon and Holloway (2002), Hussey and Hussey (2003), Gray (2004b), and

Saunders et al, (2006) stressed the importance of piloting, ensuring there were no problems in understanding and answering the questions, removing text errors and refining and improving the research instrument. Prior to the pilot study, the dissertation supervisors reviewed the questionnaire and thereafter, minor edits and amendments were undertaken to improve questionnaire readability (Swartz and Boaden, 1997).

The first pilot was undertaken as a research project on behalf of the Cardiff Chamber of Commerce (CCC). Previously, Kagan and Lau (1990), Burn and Szeto (2000) and Riemenschneider et al, (2002), improved the design of their research instrument for a large survey, based on feedback from a pilot study. The CCC was an association of 1,035 enterprises encompassing a geographical area of Cardiff, Bridgend, Newport and the Valleys areas. The CCC commissioned a survey to assess awareness of levels of E-Business amongst members. The CCC research project was an opportunity to appraise the effectiveness of the initial research instrument. The questionnaire was distributed to CCC members through a monthly postal newsletter (Appendix B Part 1). Members were expected to bear the cost of returning the survey, although offered the incentive of a prize draw, provided by CCC, for returning the completed questionnaire. Subsequently, one hundred enterprises returned the full postal questionnaire, giving a survey return of approximately 10%.

A second pilot survey was undertaken to appraise the effectiveness of the proposed delivery mechanisms of postal, telephone and personal interview and quantify cost and time implications. Forty enterprises were randomly selected from a Swansea business directory and contacted through personal interview, post and telephone (Table 16), in accordance with Gray's (2004b) suggestions that a pilot study should involve between 20 to 40 respondents. The results indicated considerable variance between the different delivery methods, with response rates varying from 21% for postal, to 100% for interview. From statistical

analysis, through observation of relative frequency returns, no variance in questionnaire responses from the different delivery methods in terms of nature or quality of response was observed. The use of personal interviews as a delivery method for the piloting of the questionnaire proved an effective mechanism to ensure any irregularities or confusions in completing the questionnaire were eradicated (Oppenheim, 1992). Furthermore, it provided key additional information regarding the time duration required to complete, the questionnaire, the clarity of instructions, removal of ambiguity, issues of confidentiality, omissions and layout (Bell, 1999). The results of the pilot study were reported within Beynon-Davies et al, (2002b) and were included within the main survey reported in Chapter Five.

Table 16: Second Pilot: Testing Delivery Methods			
	Contacted	Returned/ Completed	% Return
Personal Interview	10	10	100
Postal Delivery	14	3	21
Telephone	16	8	50

4.9.1 Research instrument amendments

As a consequence of the pilot surveys, a number of changes were incorporated into the survey instrument (Burn and Szeto, 2000). The CCC pilot survey identified the need for a number of improvements in the form of additions or amendments, due to question responses or lack of completeness of the data collected. Firstly, it was recognised that there was a necessity to explicitly identify and classify participating enterprises in the survey. Therefore, the beginning of the questionnaire was restructured to identify the enterprise size, sector and contact details. Additional questions were included to gauge and contrast the markets for traditional and E-Business trade. Further minor changes were made to the wording of several questions and categories to increase clarity. Following the second pilot study, further amendments were made to the questionnaire. It was recognised that there was a requirement to include

a number of further categories in certain questions. In question one, it was accepted that there was a need to include a "Sole-Proprietor" category to represent this statistically significant SME-sized sector. In addition, the pilot study personal interview respondents revealed the need to amend and extend the business sectors' classifications to provide further clarity for respondents e.g. the "Mining category" was amended to "Mining and Quarrying". Two additional questions were added to ascertain the implications of E-Business on enterprises' business practices and strategic planning. The CCC was identified within Appendix B part 1, whilst the seminal version of the survey questionnaire was displayed within Appendix B part 2.

4.10 The Questionnaire

The aim of this survey was to establish a realistic picture of E-Business usage within the SME sector, providing an indication of growth patterns and contributing factors. Chapter Two identified that there was a need to undertake a significant independent survey of E-Business usage that was representative of the SME community, prior surveys having been criticised for size and nature of sample and geographical coverage (Section 3.8). The questionnaire used in this study was original and specifically developed to meet the demands of the aims and objectives of this thesis. The questionnaire was developed from observation of structure and content from existing E-Business surveys (NOP, 2000; eCIC, 2002; eCIC, 2003), and a comprehensive review of E-Business literature (Chapters Two and Three).

The question frame was developed specifically to gain a greater understanding into the utilisation of E-Business and its impact on SME business practices (De Vaus, 2002). A user friendly, highly structured, closed question design was employed, utilising nominal scale tick box responses to ensure rapid completion of the questionnaire and ensure consistency of completion across the different data collection modes (Dillman, 2000; De Vaus, 2002). Each question prompted the respondent

to identify the use of technology and the degree of impact upon their enterprise. The rationale for this approach was that E-Business knowledge was validated through a body of literature as identified within Chapters Two and Three. Thus, it was possible to pre-specify the various categories of response (Remenyi et al, 1998). This approach allowed the questionnaire to be coded for statistical analysis through SPSS version 15 (SPSS, 2008).

It was recognised that given the technical nature of the subject matter, there was a need to keep the wording of the questionnaire straightforward, utilising non-technical language wherever possible and assume a basic understanding of the subject matter (Dillman, 2000; Sekaran, 2000; Hoyle et al, 2002). Furthermore, it was recognised that there was a need to construct the questions without bias or prejudicial language, or imprecision, avoiding ambiguity or leading questions, as noted by Oppenheim (1992), Gill and Johnson (1997), Babbie (1998), Arksey and Knight (1999), Sekaran (2000) and May (2001). Four pages was identified as the optimum length for the questionnaire based on previous recommended practice (Dillman, 1983; Gilham, 2000; Ibert et al, 2001; Maylor and Blackmon, 2005). As a result, the survey utilised folded A3 sheets, with questions displayed in a four-page booklet layout. This technique maximised available space, thereby reducing the perceived size of the instrument. The questionnaire was designed to funnel respondents from an initial section, which collected enterprise-related data such as organisation type and number of employees, to further applicable sections (Oppenheim, 1992; Chen and Williams, 1993).

Within the questionnaire, the survey respondents were asked to present information regarding number of employees, business market and industry sector. This design conflicted with Oppenheim's (1992) suggestion that such demographic information should appear towards the end of the questionnaire. De Vaus (2002) however, argued these questions should appear early on within the questionnaire as they were

easily answered, factual questions and provided a key to the focus for the rest of the research instrument. This approach was selected as it was felt that capturing this data at the onset of the questionnaire enabled the funnelling of non E-Business users who might otherwise become non-respondents.

Thereafter, the questionnaire utilised two forms of closed questions, namely list and category style questions (Gray, 2004b). The rationale for their use was to maintain respondent interest, provide appropriate questionnaire structure and to minimize the completion time of the research instrument. Closed questions provided a list of acceptable responses to the respondent, whilst open questions did not provide any preset responses (Frankfort-Nachmias and Nachmias, 1996; Fowler, 2002). In terms of closed questions, respondents select several options within list style responses (e.g. tick all that apply), in comparison to category type questions where only one factor would be identified (e.g. an age category). The only exception was question 4b, which could be defined as an open style question, which inquired about the impact of E-Commerce and E-Business on individual enterprises' business practices. Gray (2004b) supported a mixture of question styles and established utilisation of a variety of answering formats provided a greater level of interest for the respondent.

In terms of questionnaire flow the initial instructions identified the purpose of the research instrument and provided assurance of confidentiality. Thereafter, the questionnaire was divided into sub-sections with individual "go to" or contingency questions and instructions (Dillman, 2000; De Vaus, 2002; Babbie, 2004). The questionnaire was sequenced to consider basic enterprise use of IT/IS and thereafter increasingly sophisticated technologies, such as website deployment, E-Commerce and E-Business usage (Gill and Johnson, 1997). The design of the questionnaire was underpinned by the need to cater for a mixed method data collection strategy. To this end, the questionnaire was structured into eight sections, as undertaken in Lawson

et al, (2003). Figure 16 illustrated the flow of the questionnaire, as explained in the following sections. The description of each questionnaire section included a summary of the questions and examples of categories within, to aid readability. Sections within the questionnaire were numbered one to seven, with further questions within each category identified through a sub-lettered coding system (e.g. 1a, 1b) (Robson, 2002). The definitive questionnaire was displayed in Appendix B part 2. The analysis of individual questions was presented in the following sections.

4.10.1 Section 1: Enterprise demographics

Questions:-

Please indicate how many people are currently employed by your organisation (e.g. Sole-Proprietor, 1-9, 10-49, 50-249)?

What is the main industry activity of your organisation (e.g. Agriculture/Forestry/Fishing, Mining and Quarrying, Services/Transport etc)?

Identify your main business markets for your 'normal' business market (e.g. as a % within Wales, the rest of the United Kingdom, European Union or globally).

This section collected classification information regarding the targeted SME and included the number of employees, industrial sector of operation and business market, through one three-part question as previously undertaken by Donckels and Lambrecht (1997) and MacGregor (2003). There was value in identifying the nature of the enterprises pre and post E-Commerce trading market (Jones et al, 2003b). This data proved useful when cross tabulating against other factors to identify key trends within the dataset (Gray, 2004b). Introductory text was provided, explaining the rationale for collecting this data (May, 2001). The industrial sectors were identified from the SBS classification (1999) of business types as identified within Section 4.6.3.

4.10.2 Section 2: Enterprise use of information communication technology

Questions:-

Please choose, from the descriptions below, the one that most aptly describes your business's use of information technology (e.g. Agriculture/Forestry/Fishing, Mining and Quarrying, Construction etc).

What proportion of employees in your organisation use information technology on a daily basis (e.g. up to ¼, up to ½ etc)?

Please indicate the number of people in your organisation with full-time responsibility for purchasing, installing and/or maintaining information technology (e.g. None, 1 etc).

Please identify the job title of the individual responsible for IT (Purchase, implementation and maintenance) within your organisation (e.g. Owner, Partner etc).

This section presented respondents with one four-part question. The focus of the question was to ascertain the position of the enterprise in terms of its general use of ICT. It revisited some of the focal issues addressed in an earlier Wales Information Society survey (WDA, 2001) and Doherty et al, (2001), such as levels of ICT infrastructure and support. This question provided a branch-out mechanism for enterprises that were non IT/IS users, taking the respondent to the end of the questionnaire as illustrated in Figure 17 (Remenyi et al, 1998; Hair et al, 2003). It was decided not to investigate the reasons for a lack of any form of IT/IS within enterprises surveyed, as this was beyond the remit of this particular study.

4.10.3 Section 3: E-Business and current business

Questions:-

Does your organisation use any of the following types (e.g. EDI, intranet, extranet) of Information Technology?

Does your organisation have access to the Internet (Yes/No)?

How does your organisation currently connect to the Internet (e.g. via a modem and telephone, a cable modem etc)?
What does your organisation use the Internet for (e.g. Electronic mail, Finding information)?
Does your organisation currently have a website and what do you use it for (e.g. do not have a website, Advertising/Marketing to customers)?
What body developed your website (e.g. In-house, web design organisation)?
How much did your site cost your organisation to develop (e.g. £0-£100, £101-£500 etc)?
What level of income have you generated from your Internet site during the last 12 months (e.g. £0, £1-£99, £100-£249 etc)?
Identify your main business markets for your E-Commerce market via a % (e.g. Within Wales, Rest of UK etc).

The third section involved one question with nine multiple-choice sections. This was required to construct a question that encompassed the complexity and range of E-Business usage. The question focused on E-Business and how sampled enterprises utilised technology. Issues covered included access, means of connection, usage, website deployment and consideration of other information technologies. The precedent for this question design and scope was prior E-Business studies, including Ng et al, (1998) and Greaves et al, (1999). The question included two filters out to Section Five for enterprises that did not have access to the Internet or possessed a website (Figure 17). This action asked respondents to identify the barriers to E-Business, which might have deterred their usage.

4.10.4 Section 4: Drivers for adopting E-Business

Questions:-
What reasons have led your organisation to consider E-Business (e.g. Communications cost savings, access to new markets etc)?

Has you organisation's adoption of E-Business resulted in any changes in your business practices?
Have your E-Business activities been integrated within your business plan (e.g. Yes/No/Don't Know)?

This section, involving one three-part question, identifies the drivers for adopting E-Business, as considered within Owens and Beynon-Davies (2001b). The aim of the question was to understand the individual enterprise's perception and motivation for E-Business uptake. A multiple-choice question was selected, as the various drivers for E-Business were known variables (Section 3.6). The first and third parts of the question were multiple choice, whilst the second was open ended. Similarly, part three required confirmation (either Yes, No or Don't Know), as to whether E-Business was imbedded within enterprises business plans. The second question utilised an open ended style to inquire about the individual impact of E-Business on organisations business practices.

4.10.5 Section 5: Barriers to adopting E-Business

Question:-

What factors have limited or constrained your organisation's adoption of E-Business (e.g. insufficient time, skills financial resources etc)?

This section involved one multiple choice question, asking the respondents to identify the possible explanations for SMEs not adopting an E-Business strategy, including the negative influence of such factors such as limited time, IT/IS skills and financial resources. A multiple-choice question was selected because the barriers to E-Business usage were known variables as established within Section 3.5.

4.10.6 Section 6: Benefits of E-Business

Question:-

Which of the following proposed benefits of E-Business are currently relevant to your business, and which do you believe will be relevant to your business over the next five years (e.g. Reduced cost of communication with customers, Increased revenue etc)?

This section involved one multiple-choice question, whereby respondents were asked to classify their perceptions of benefits of E-Business and differentiate between current and future relevance. A multiple-choice question was utilised because the benefits of E-Business were known variables as noted in Section 3.5.

4.10.7 Section 7: Problems of E-Business

Question:-

Which of the following perceived problems with E-Business are currently relevant to your business and which do you believe will still remain relevant to your business over the next five years (lack of security, bandwidth problems etc)?

This question asked respondents to identify problems of E-Business and differentiate between current and future relevance through a multiple-choice question. A multiple-choice question was selected as the problems associated with E-Business usage were known variables, as identified within Section 3.6 and prior studies such as Min and Galle (2002).

4.10.8 Section 8: Further information

Question:-

Would you like a copy of the results of the survey?

This section identified whether survey respondents would like a copy of the results of the survey or required any further information about E-

Business development. This was included as a courtesy to survey respondents.

4.11 The rationale for Case Study Research

The objective of the case study research was to explore the phenomenon of E-Business usage, within the SME, through exploratory investigation (Benbasat et al, 1987). Case research was identified as the optimum method of exploring the usage of E-Business within SMEs, due to its tradition as a method of providing rich contextual data (Levy and Powell, 1999), and allowing in-depth examination of the subject material (Hakim, 1997; Owens and Robertson, 2000). Benbasat et al, (1987), Poon and Swatman (1997b), Tiessen et al, (2001) and Chau (2003), supported the use of a case study interpretative approach to capture the in-depth information regarding beliefs, actions and experiences of E-Business activity within the context of the SME (Cavaye, 1996). Benbasat et al, (1987) and Yin (1994) suggested that, where the boundaries of research were unclear, there was a need to investigate the issues within a real life context. Schlenker and Crocker (2003) proposed that a qualitative approach appeared particularly useful in exploring the business value of Internet technologies in SMEs.

Lee (1989), Amaratunga et al, (2002) and Hussey and Hussey (2003), supported the use of case studies as exploratory research, which could be utilised, where knowledge was deficient as within this study. The use of a case study methodology complements and extends the trends revealed within the quantitative survey undertaken within the first part of this study, as mooted by Poon and Swatman (1997c) and Poon and Swatman (1999a). Partington (2002), records that quantitative surveys were based on broad generalisations from average influences. Moreover, Starbuck (1995) and Woodside and Wilson (2003), questioned whether generalisations enabled a true understanding and queried whether population trends related to individual cases. They argued large samples generated statistics that lacked meaning, variety, individuality and were

simplistic, in contrast to the holistic view provided by case studies (Patton and Appelbaum, 2003).

Silverman (2000) suggested that quantitative surveys excluded the observation of everyday behaviour Gummesson (1991), Yin (1994), Remenyi et al, (1998), and Perry (1998), and argued that the use of case studies constituted a comprehensive, rigorous and coherent research tactic, which enhanced academic knowledge. The factors influencing E-Business development within the SME were controlled and managed by the Owner/Manager within the enterprise. Ghauri and Grønhaug (2002) found that a case study was an appropriate research strategy, where a phenomenon was difficult to study outside its environment. E-Business usage within SMEs certainly applied to this context. Therefore, the only method of acquiring this knowledge was to interview the Owner/Manager, and other key parties in depth, and record the longitudinal development of E-Business within the enterprise. Thus, the case study method enabled the "how" and "why" questions to be asked, to clearly understand the nature and complexity of the processes that were taking place (Benbasat et al, 1987).

The case study included a longitudinal perspective, whereby the participants were revisited within an eighteen-month timeframe to explore and evaluate the impact upon them (Remenyi et al, 1998). This strategy strengthened the validity of the findings (Babbie, 1998). An eighteen-month timescale was deemed sufficient in this case due to the rate of technological change and business closure rate within the SME sector. Utilising a case method enabled the thesis to meet the first and second objectives identified within this thesis and provided significant evidence towards the third objective (section 1.0).

Similar research strategies were undertaken by Huerta and Sanchez (1999), Thoburn et al, (1999) and Baskerville and Pries-Heje (2001), in the context of IT/IS diffusion within enterprises, and Darke et al, (1998), who recommended a case study methodology for investigating business

strategy involving the use of the Internet. Poon and Swatman (1997c), Bode and Burn (2001), Al-Mashari (2002), Taylor et al, (2002), Chau (2003), Levy and Powell (2003), MacGregor (2003), Schlenker and Crocker (2003) and Barnes et al, (2004) evidenced effective use of case study investigation of Internet usage within SMEs through studies of E-Commerce and E-Business usage. Furthermore, Elliot and Loebbecke (2000), Tetteh and Burn (2001), Levy and Powell (2003), Chan and Swatman (2004), deployed a case study methodology in their investigations of business- to-business E-Commerce.

Yin (1994) and Woodside and Wilson (2003), identified that multiple case research should be treated in the same way as multiple experiments, to produce a replication logic from each study. Remenyi et al, (1998) and Gummesson (1991), identified that case studies could be considered a viable and comprehensive research strategy, and be utilised from both a positivistic and phenomenological perspective to produce, support or contradict an established theory. In addition, there has been extensive use of single or multiple case studies to investigate inter-organisational systems (Loeb et al, 1998). Benbasat et al, (1987) and Eisenhardt (1989), supported the use of case studies in situations where research and theory were at a exploratory stage. Thus, case study research would provide a rich exploratory picture of the usage of E-Business within SMEs and evidence the factors facilitating or inhibiting usage.

The use of case studies have been criticised as giving rise to anecdotalism (Smith, 1991), and the threat of not maintaining researcher objectivity in collecting and analysing information (Murrey, 1995; Remenyi et al, 1998; Salkind, 2003). Such issues were addressed by use of a case study protocol, as discussed in Section 4.13. Moreover, case studies were recognised as time-consuming and expensive in terms of the researcher's time and documentation that they generated (Remenyi et al, 1998). Therefore, it was essential to retain objectivity and avoid bias in the design of the research instruments and data collection phase for the

case study. Consequently, a rigorous case study design process was undertaken, which was identified within the next section.

4.12 The Design of the Case Study

Yin (1989: 23) provided the most recognised definition of the case study as: -

> *"An empirical enquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between phenomenon are context are not clearly evident, and in which multiple sources of evidence are used."*

Bell (1995) and Salkind (2003) suggested a simplistic explanation, describing it as an umbrella term for a family of research methods, with the commonality of a central research focus. Benbasat et al, (1987), Eisenhardt (1989), Yin (1994), Remenyi et al, (1998), Ghauri and Grønhaug (2002), Robson (2002), Rowley (2002c) and Gray (2004a), recognised that data collection methods could comprise several methods, including verbal reports, personnel interviews, direct observation, the use of financial reports, market and competition reports, archives and budget and operating statements. Therefore, in designing the case study process, it was vital to ensure consistency of practice and academic rigour. Flynn et al, (1990) suggested a process model for conducting empirical research, namely establishing the theoretical foundation, selecting the research design and data collection method, the implementation and finally analysis. Similarly, Brown and Eisenhardt (1995) advocated the following stages in building theory from case material:-

- getting started; defining the research question
- selection of cases
- creation of research instruments and identification of data collection methods
- undertaking the data analysis and data collection
- analysing the case data

- searching for cross-case patterns
- shaping hypotheses; the theory-data relationship
- enfolding literature: validation/generalisation
- closure: empirical and general saturation
- outputs: may be concepts, conceptual frameworks, propositions or mid-range theory.

Therefore, to ensure consistency and academic rigour within the case studies, the study recognised the need to adopt a structured process. Remenyi et al, (1998) and Power and Sohal (2002) recommended use of a case study protocol including detail of the main objective and issues, field procedures, questions, guide to the case study report and piloting. Moreover, use of a case study protocol enhanced the external validity of the study (Rowley, 2002c).

4.13 Case Study Protocol

The following section described the case study protocol including its objectives and issues, field procedures, questions, guide to the case study report and piloting.

4.13.1 Objectives of the case study

The objectives of the case study research was to investigate and verify the understanding and perceptions of E-Business usage amongst SME Owner/Managers, thus providing evidence towards all stated objectives of this thesis (Section 1.0). The actual unit of analysis was the organisation under investigation, in this case the selected SMEs (Benbasat et al, 1987; Mehrtens et al, 2001; Rowley, 2002c). The key evidence was collected from Owner/Managers of SMEs through a series of structured interviews, allowing informants the opportunity of supplying information on a wide diversity of issues related to the use of and development of E-Business technologies (Walsham, 1995; Remenyi

et al, 1998; Partington, 2002). Walsham (1995) and Levy and Powell (2003), noted that interviews were a key feature of successful cases, enabling the best access to the interpretations and views that participants have regarding actions and events which have taken place. A list of research topics were developed to provide a research agenda for each interview, which were identified and discussed within the following section. During interviews, the informants were given the opportunity to respond without interference to insure no bias occurred (Remenyi et al, 1998). The key issues on which each case study focused were:-

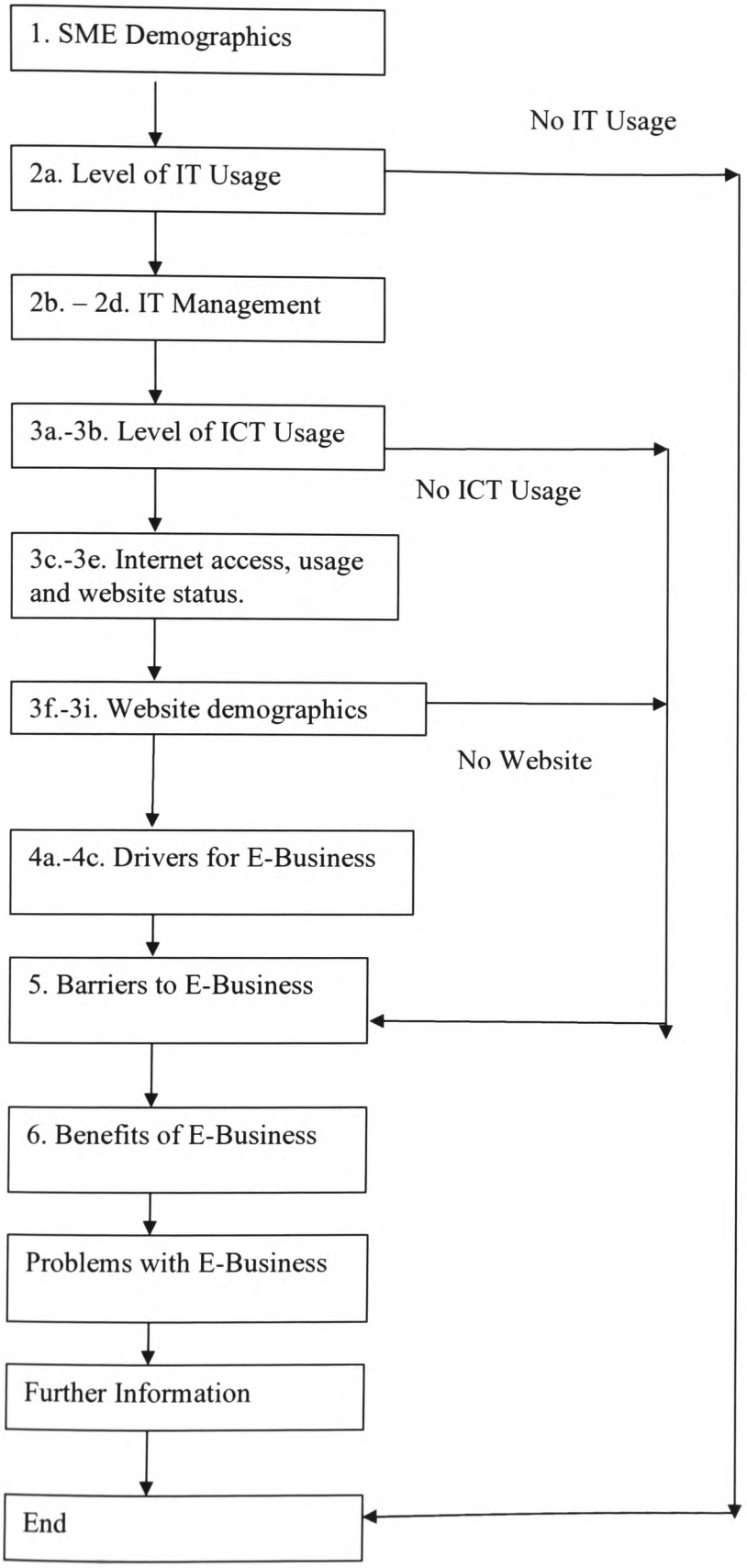
- investigate SME "Sole-Proprietor" Owner/Managers understanding of E-Business technologies and recognition of strategic importance
- recognise and evaluate the factors associated with E-Business usage within micro-sized SME classifications
- appraise E-Business usage patterns prevalent within the SME "Sole-Proprietor" micro-sector.

These issues were determined by the aims of the study identified within Section 1.0 of this thesis.

4.13.2 Field procedures

The field procedures provided detail regarding the nature of the case study and data collection procedures undertaken. Remenyi et al, (1998) stated that such procedures should include defining who should be interviewed, accessing the interviewees, availability of resources, input of other researchers, scheduling the evidence collection activities and providing for contingencies.

Figure 16: Quantitative Questionnaire Structure and Flow



The following field procedures were identified: -

- interview, where possible, at least two individuals within each enterprise, including the Owner/Manager, individual responsible for IT/IS (if different) and/or any significant IT/IS users (Chen and Williams, 1993; Mehrtens et al, 2001)
- initial contact with the enterprise should be at the highest level (e.g. Owner/Manager) through letter, electronic mail and telephone mediums
- analyse enterprise use of E-Business over an eighteen-month time period to evaluate enterprise adoption of technology. This would be achieved through two in-depth interviews at each end of the time period. Enterprise visits would be undertaken by prior agreement or alternative arrangements being agreed
- interviews would be tape recorded, with permission being sought on initial contact with the enterprise. The advantage of this approach was that it provided a full description of the interview, in comparison to other methods (Walsham, 1995). If permission were not granted, then written notes were taken during the interview (Poon and Swatman, 1997c; Mehrtens et al, 2001). In such cases, the interviews would be transcribed immediately afterwards, to ensure that as much information as possible was recorded
- where possible documentary evidence was sought to support the verbal information collected. This included any documents related to the use and performance of E-Business within the enterprise e.g. sales reports and website material (Benbasat et al, 1987; Chan and Swatman, 2004)
- undertake an evaluation of enterprise website (if in existence), as posited by Ng et al, (1998) and Mehrtens et al, (2001). The evaluation would comprise set criteria, identified within Section 3.7 based on prior studies (Dholakia and Rego, 1998; Barnes and Vigden, 2002; Kim et al, 2003; Rattanawicha and Esichaikul, 2005). The purpose of this analysis would be to identify the functionality, scope

and contribution of the organisational website to business practices based on the aims of this thesis and informed by the academic literature

- to ensure the effective recording of case histories and the reliability of the method, a case study database was created (Yin, 1994; Darke et al, 1998; Rowley, 2002c). The database comprised written and electronic case notes from each study, which was organised and categorised alphabetically. An example of a case history, enterprise A was displayed in Appendix E (Remenyi et al, 1998).

4.13.3 Validation of case study research

To ensure the validity and reliability of the case study approach, a number of techniques were utilised. Yin (1994) and Riege (2003) suggested the need for construct validity, internal and external validity, and reliability to improve the quality of the case study evidence. Construct validity was ensured by the use of multiple sources of evidence in the data collection phase see Section 4.16. (Flick, 1992; Rowley, 2002a). Moreover, the interview transcripts and observation notes produced during each case study for the case study database provided a chain of evidence regarding the effectiveness of the data collection phase (Hirschman, 1986). Construct validity was maintained by reviewing the draft case study reports in the writing up phase (Riege, 2003).

To ensure internal validity, a number of procedures were observed; firstly, within-case analysis and cross-case analysis was undertaken during the data analysis phase (Miles and Huberman, 1994). Secondly, illustrations and diagrams were utilised in the data analysis stage (Chapters Five and Six) to assist explanation building (Miles and Huberman, 1994). Finally, the assurance of internal coherence of findings in the data analysis phase was achieved by cross-checking of results (Yin, 1994). External validity was ensured through the deployment of literal replication logic in each case study (Eisenhardt, 1989) and by providing clear definitions regarding the scope and

boundaries in the research design phase (Section 4.15). In addition, case study evidence was compared with the extant literature in the concluding phase thus identifying contributions to knowledge. Reliability of the case study process was ensured through the development and adherement to the case study database, protocol and pilot study. Such procedures ensured a rigorous and consistent process was undertaken in the collection of all case study material and thereafter the analysis of results.

4.13.4 Case study questions

The key element of the protocol was the set of questions reflecting the inquiry. Given the awareness regarding the factors influencing the dynamic phenomenon of E-Business (Section 3.8), e.g. a type of technology in existence, a semi-structured research instrument was developed with a set of open ended questions and issues to explore (Partington, 2002). Thus, enabling the respondents to discourse freely on the topics capturing their interest (Johannessen et al, 1999). These questions were utilised as prompts for each case study interview, ensuring no variation from the research foci (Poon and Swatman, 1998). The phenomenon of E-Business growth has the potential of being dynamic, with the introduction of new technologies (Mehrtens et al, 2001). Evidence suggested, however, that the SME sector, especially the "Sole-Proprietor" sized sector, was reluctant to utilise such technologies (Section 3.8). As with the quantitative survey identified within Section 4.10, this structure and content, of the case study questions had been informed by previous E-Business studies and surveys (NOP, 2000; Chau, 2003; Lawson et al, 2003). The questions were structured into three sections as follows:-

Enterprise Demographic:-

- demographic description – employees, turnover, industrial sector, product and service

- background history of enterprise – year of formation, development and growth.

This information was useful to contextualise the use of E-Business within the particular industrial sector and consider the importance of enterprise size in terms of number of employees (Poon and Swatman, 1999a; Levy et al, 2001; Gray, 2004a).

E-Business usage:-

1. *Describe your enterprise's use of IT, including identification of all systems and their usage.*
2. *Identify why these systems are deployed.*
3. *Describe the development of IT usage within your organisation.*
4. *Has the use of IT influenced your organisations development?*
5. *How important is IT use to your organisation?*
6. *Do you consider your IT development within your strategic plan for your business?*
7. *Do any barriers exist to you further developing your use of IT?*
8. *What are your motivations for utilising IT within your enterprise?*
9. *Do you have plans to further develop your IT usage?*

As with the quantitative survey questions identified within 4.10–4.10.8, this section aimed to investigate organisational deployment, development and understanding of E-Business usage. Within these questions, the technology was described in simple terms (e.g. IT as opposed to E-Business), to aid respondents' understanding of the terminology. With each of the above questions, respondents were asked to justify their response. These questions were informed by previous studies of the phenomenon of E-Business within the SME sector, as discussed within Chapter Three.

Use of the Internet and website:-

10. What impact does the Internet have on your enterprise?
11. What do you use the Internet for within your enterprise?
12. Describe the development of your organisation website over the last three years.
13. What inspired/influenced you to create an organisation website?
14. Who actually developed your website?
15. Describe the purpose and uses for your organisation website.
16. How was the website maintained?
17. Did any individuals or bodies influence your decision to introduce a website?
18. Do you consider the role of your website within your business plan?
19. What impact has your website had on your organisation?
20. Has your organisation website changed your customer base?
21. Has the website changed your business practices in any way?
22. Do any barriers exist to you further developing your use of your website?
23. What are your motivations for utilising a website within your enterprise?
24. Does your website have any impact on your customers and suppliers?
25. What are your future development plans for the website (e.g. within a three year timescale)?

The questions within this sector were again informed by extant literature (Poon and Swatman, 1997a; Poon and Swatman, 1998; Poon and Swatman, 1999b) and surveys (eCIC, 2003; eCIC, 2004; eCIC, 2005), and built on the questions identified within this section. This section focused on organisational use of the Internet and website deployment issues. In all cases, respondents were asked to justify their responses. These interviews were undertaken in sessions ranging between 45-60 minutes, as suggested by Poon and Swatman (1999a), McGowen et al, (2001) and Detlor (2003). On the return visit, the same research instrument was utilised as a reference guide. The second interview took

the form of an informal discussion, with the Owner/Manager, to assess the level of impact and change upon the enterprise as a consequence of E-Business usage during the period since the first interview.

4.13.5 Case study report

The final stage of the case study design involved the construction of a case study report. This process, informed by Patton (1990), identified a three-stage approach of assembling raw data, constructing a case record and writing a case study narrative. The final report was constructed utilising a question and answer format for each of the case studies (Gray, 2004a). The report provided an indication and guide as to the final content and layout of each case study. The following headings were established as the key points of the case study reports:-

- overview of participants
- usage and impact of IT/IS
- usage and impact of E-Business
- barriers to E-Business
- drivers to E-Business
- perceptions – motivations
- E-Business and its strategic management and planning
- website utilisation and deployment
- conclusions on E-Business utilisation.

A profile for each case study was provided within Appendix E, whilst Section 4.16.3 identified how the data analysis for the case studies was undertaken. This process ensured that there was a consistency in the analysis of each case study.

4.13.6 Selection of SMEs for case study

To illustrate the nature of E-Business usage, it was necessary to utilise a multiple case study methodology. Daymon and Holloway (2002) and Robson (2002), recommended the use of multiple case studies where investigations allowed the researcher to identify distinctive features by exploring the similarities and contrasts between different cases. Perry (1998) supported the use of multiple cases in postgraduate research, as they enabled cross-case analysis for richer theory building. Thus, micro-sized SMEs with different deployments and experiences of E-Business throughout the region under investigation, to encapsulate the differing growth patterns would be investigated (Tiessen et al, 2001; Chan and Swatman, 2004), therefore highlighting the different characteristics relevant to the research question (Miles and Huberman, 1994).

The differing usages of E-Business were identified within the quantitative survey undertaken within Chapter Five of this thesis. Within this selection were cases of maximum variation, which identified the extremes of E-Business usage from high to low deployment (Perry, 1998) to enable contrast between the two phenomena. SME Owner/Managers were contacted via telephone to establish their willingness to participate in the study. Thereafter, a personalised letter was sent to each enterprise, detailing the nature and scope of the study and confirming the dates of the interview (Darke et al, 1998; Chau, 2003).

It was decided to focus the case study research on the SME "Sole-Proprietor" sector after undertaking the literature review. The rationale for this decision was the lack of consideration of this statistically significant SME micro-sized classification within the existing literature (Section 2.2). Levy et al, (2001) argued that enterprise size was not a determinant of E-Business usage, with the Owner/Manager's knowledge and attitudes towards growth being the predominant factor, however, this required further verification. By contrast, Fillis and Wagner (2005) noted that SMEs were not a homogeneous group and their needs and

wants and circumstances varied by sector and enterprise size. They argued that high technology, knowledge intensive SMEs were more likely to adopt E-Business than other sectors.

To evaluate the phenomenon of E-Business usage within the SME sector, ten SME case studies were selected from the quantitative survey (Chan and Ngai, 2007). The rationale for this number was best practice and precedent identified within prior E-Business studies. In terms of best practice, Darke et al, (1998) recognised the significant debate regarding the optimum number of case studies to include. Rowley (2002a) and Eisenhardt (1989), proposed between four and 10 cases, whilst Hedges (1985) suggested an upper limit of 12, due to the costs involved in interviews and the quantity of data requiring analysis. In prior studies, Mehrtens et al, (2001) investigated Internet adoption within SMEs, employing seven case studies, Karlsbjerg and Damsgaard (2001) and Al-Mashari (2002) utilised eight, Pavic et al, (2007) nine and Power and Sohal (2002) and Chan and Ngai (2007) both 10.

Therefore, within this thesis, a 'typical' case representing a category of SMEs E-Business usage as the rationale for this level of deployment was selected (Stake, 1995). Thietart et al, (2001) identified this phenomenon as theoretical replication, whereby each case produced different results for predictable reasons. Thietart et al, (1999) noted that the number of cases of theoretical replication depended on the number of conditions expected to affect the phenomenon under investigation. Having selected the cases, there was a need to pilot the research instrument utilised within each case study.

4.14 Piloting the Case Study

As within the quantitative study, a pilot was undertaking to verify the research instrument and methodological process (Remenyi et al, 1998; Robson, 2002), as witnessed in Chan and Swatman (2004). A micro-sized "Sole-Proprietor" SME was selected based on its competent level

of E-Business usage, to ensure all aspects of the research instrument were evaluated. The SME selected (Enterprise A, identified within Appendix E), was identified from the quantitative survey undertaken within Chapter Five of this thesis and contacted by telephone. The interviewer was introduced to the Owner/Manager and explained the purpose of the communication, identifying the Owner/Manager's willingness to participate and information requirements. Thereafter, a meeting was arranged and a letter sent to the participants confirming the interview details. The interviews with respondents were tape recorded with prior permission of the participants (Smith, 1991). To ensure the accuracy of the interviews, participants were sent a transcript of the interview for approval.

4.15 Conducting the Multiple Case Study

The multiple case study methodology was conducted following the guidelines proposed by Yin (1994), namely: -

- the selection of cases
- the design and pilot of research tools
- protocols and field procedures
- undertaking the study
- drawing cross agent conclusions
- writing the report.

The selection of cases and design of the piloting of the research instrument and procedures were considered within Section 4.14- 4.15. For each enterprise investigated, a case study report was written, whereby the data was collected, analysed and synthesized. Thereafter, each case study was cross compared utilising a qualitative methodology to identify converging evidence to understand E-Business usage. The issue of confidentiality and anonymity were addressed within Section 4.17.

4.16 Analysis of Results

The results of this study were analysed into two separate groups, according to the quantitative and qualitative method discussed previously.

4.16.1 Quantitative survey

The questionnaire responses were entered into SPSS (V15.0) as they were received. SPSS was selected as the analytical software to be utilised, as it was identified as having all the necessary functionality to analyse the quantitative data within the questionnaires (Field, 2005) and was widely employed within SME research (McCole et al, 2001). The variables within the research instrument were coded according to the classifications provided within the research instrument. Both ordinal and nominal measures were deployed; ordinal listing whereby the occurrences of a variable as a number (e.g. the delivery method variable, identified as DELIVERY had three potential occurrences namely, 1= Postal, 2 = Personal Interview and 3 = Telephone), and nominal whereby an arbitrary number was assigned to a variable identifying a particular condition (e.g. Internet access 1 = Yes and 2 = No).

4.16.2 Quantitative analysis undertaken

To analyse the data, a range of univariate statistical methods were employed to enable comparison with prior surveys (Section 3.8), to identify significant data trends and abnormalities. Frequency counts of the survey population were undertaken to identify summarised individual responses to questions (Maylor and Blackmon, 2005). In addition, cross-tabulations were utilised to allow comparison between subcategories of variables (e.g. the various SME size categories' frequencies utilisation of E-Business technologies) (Field, 2005). These were converted into percentages to provide equality in the comparison. To further contrast this data, measures of central tendency and dispersion were utilised, as in

Mustaffa and Beaumont (2002). Measures of central tendency were utilised to identify averages which were widely used within prior surveys (Section 3.8), as a method of evaluating technological trends within SMEs (eCIC, 2005).

Similarly, measures of dispersion, such as standard deviation were utilised to evaluate levels of variance from the mean (Antonius, 2003). To evaluate the relationship between variables, e.g. between SME size classification and IT/IS usage, bivariate statistical measures were deployed namely chi-square analysis. The range of more sophisticated statistical techniques was restricted due to the categorical nature of the data collected and the necessity to enable comparison with prior studies. Moreovcr, it was felt that advanced statistical analysis would provide limited value in the evaluation of E-Business behaviour within the SME community whereby the attitudes and perceptions of the Owner/Manager were considered the most important elements in capturing the reality of E-Business SME usage.

4.16.3 Qualitative study: data analysis of case studies

Cohen and Manion (1997) argued that there were no clear guidelines for analysis of qualitative data, which raised concerns regarding potential reliability and validity of research findings. A key threat being the possibility of the researcher being overwhelmed by the quantity of data (Patton and Appelbaum, 2003), although King (1994) argued it was necessary to become familiar with the data. To avoid this threat, the data analysis stage was informed by the principle of domain analysis. This involved an inductive approach to concepts and models construction whereby theories, were derived directly from the data or in the actual data. The inductive process was reliant on an iterative process of reading and rereading the qualitative data to detect key emergent themes and constructs embedded in the data (Neuman, 2000). Within this study domain analysis was utilised to identify the conceptual complexities in

the data and semantic relationships that existed within and between the data across the case studies.

Domain analysis was utilised to complement and extend the initial data analysis by distinguishing the semantic nature and meaning of the relationships between the variables, thus supplying enhanced insight into the phenomena of E-Business growth. Domain analysis provided a method for collective comparison of multiple case studies, while retaining a degree of richness and meaning associated with concepts, themes and relationships across all the enterprises. To provide structure to the large quantities of data, a coding system was utilised to categorise the data to reflect the research questions. This process was informed by Miles and Huberman (1994), who proposed a procedure of data reduction, data display and conclusion drawing and verification in the analysis of qualitative data. Thus, the data was sorted and placed into sections identifying factors associated with E-Business usage, basically achieved by cutting and pasting the relevant data into these emergent themes. Brewerton and Millward (2001) found that this was a justifiable technique to ensure avoiding any prejudice or bias.

A transcript was made of all interviews undertaken within each case study, using a standard word processing package and thereafter was content analysed to identify the emergent themes (Smith, 1991). This involved, in this first instance, a key word search through the narrative, and thereafter, a cross-comparison of the emergent themes. Although time-consuming, it was recognised as the only viable method to elucidate real meaning from the case study transcripts. A narrative text approach was adopted to enable an accurate description of the data as related to the phenomena of E-Business usage (Strauss and Corbin, 1990). A sample of 25% of all case study interview transcripts were checked against the original audiotapes for accuracy (King, 1994). The respondent comments utilised within the case study were selected as they provided the key evidence towards fulfilling the objectives of this thesis, namely

identification of factors associated with E-Business usage within the SME.

4.17 Confidentiality and Ethics

This section outlined the issues of confidentiality and ethics and their impact upon this thesis. Issues of confidentiality and ethics underpinned the methodology employed within this study. Miles and Hubermann (1994), Gill and Johnson (1997), Babbie (2004), Daymon and Holloway (2002), Fowler (2002), Ghauri and Grønhaug (2002), Hoyle et al, (2002), Mason (2002), Cooper and Schindler (2003) and Hair et al, (2003), identified ethical issues such as preserving participant's anonymity, not causing participant stress or asking them questions detrimental to self interest, avoiding deception or coercion or involving individuals in research without their consent. Sieber (1992) defined confidentiality as agreements with a person or organisation about what will and will not be done with their data, which may include legal constraints.

Accordingly, every effort was made to preserve these ideals and ensure appropriate standards of confidentiality and ethics were applied throughout the study (Saunders et al, 2006). The research strategy was discussed and accepted by the University of Glamorgan's Ethics panel. Both the quantitative and case study methodologies required respondents to supply some potentially sensitive and confidential information. Informed consent was obtained from both survey and case study respondents after the nature and purpose of the research had been explained (Maylor and Blackmon, 2005).

In both cases, respondents were issued with a statement assuring anonymity and confidentiality thereafter (Cassell and Symon, 2004; Maylor and Blackmon, 2005). For the quantitative survey, all respondents were issued with a signed letter detailing the rationale for the survey and a statement assuring anonymity and confidentiality of any

information provided (Jankowicz, 2000) (Appendix A, Part 1). Each survey respondent was provided with a reply paid envelope.

Similarly, case study participants received an initial letter establishing their willingness to participate and the statement confirming anonymity and confidentiality (Appendix A, part 2). Thereafter, participants were confirmed via telephone and E-mail, and the process of recording the interviews by audiotape was discussed and assurances provided over any concerns. Ten of the 17 enterprises contacted agreed to be interviewed and participated in this stage of the study. Ghauri and Grønhaug (2002) stressed the importance of ensuring results were reported objectively and honestly. Consequently, results were presented impartially, honestly and objectively to ensure no embarrassment, disadvantage or harm was incurred to any study participants at any stage during the research process (Remenyi et al, 1998; Saunders et al, 2006).

Post interview, a transcript was prepared for the data analysis (Chau, 2003) and a copy sent to interviewees (Levy and Powell, 2003). Any ambiguities or inconsistencies that were identified at this stage were corrected by contacting the interviewees to clarify any issues. Within this study, the identity of both the case study and survey respondents was protected by using a pseudonym coding system (Marshall et al, 2001). Thus, a case study respondent would be identified as person X from case study A as mooted by Babbie (2004). All information held on survey and case study participants was kept in a secure filing cabinet and destroyed once the research process was completed.

In summary, this thesis ensured that both survey and case study respondents had participated consentingly and respondents identity was protected at all times, during the collation and reporting of the data (Jankowicz, 2000). Moreover, the research strategy was undertaken in a responsible and professional manner using the appropriate means of data collection and interpretation of results for a study of this type.

4.18 SME Demographics and Response Rates

Sections 4.5-4.11 provided a detailed description and rationale for the survey methodology deployed. The three data collection methods were utilised concurrently over a six-month period, between October 2003 and March 2004, namely interview, postal and telephone, to achieve a survey response of 500 respondents. Table 17 illustrated the response rate from each collection method. The most effective method in terms of response proved to be personnel interview (85%), whereby the interviewer would visit an enterprise and await completion of the questionnaire. The main drawback with this method proved to be the time scale required to visit each enterprise individually.

The telephone collection method (38%) proved to be the second most successful data collection method and achieved the highest number of returns, 211 (42% of sample). This response rate was within the range suggested by Remenyi et al, (1998) as acceptable. Telephone proved an effective method of contacting enterprises, although there was a high occurrence of redundant numbers. Postal returns provided the least efficient method of data collection in terms of respondent response rates (21%), although still contributed 37% of total responses. The response rate of 21%, was disappointing in contrast to studies such as Love et al, (2005) (52%) and Mitchell and Clark (1999) (42%). However, it was markedly superior to studies by Lau and Voon (2004) (16%) and Ramsey et al, (2003) (11%).

The sample return reflected the reluctance of Owner/Managers especially the "Sole-Proprietor" sector to commit their time with no potential of reward for their efforts. Moreover, 94 questionnaires (11%) were returned undelivered, due to enterprise closure, data redundancy or change of address, and four questionnaires were returned uncompleted. This was unfortunate but unavoidable given the inherent inaccuracy of the SME directories utilised as the prime data source. This proved

inconsequential due to the quantity of substitute data available within the directories.

Table 17: Questionnaire Response by Delivery Method as a Percentage				
Data collection method	Returned f	Total sample f	% of data collection method	% of total Sample
Postal	185	872	21	37
Personnel Interview	104	122	85	21
Telephone	211	549	38	42
Total	n=500	1543	32	

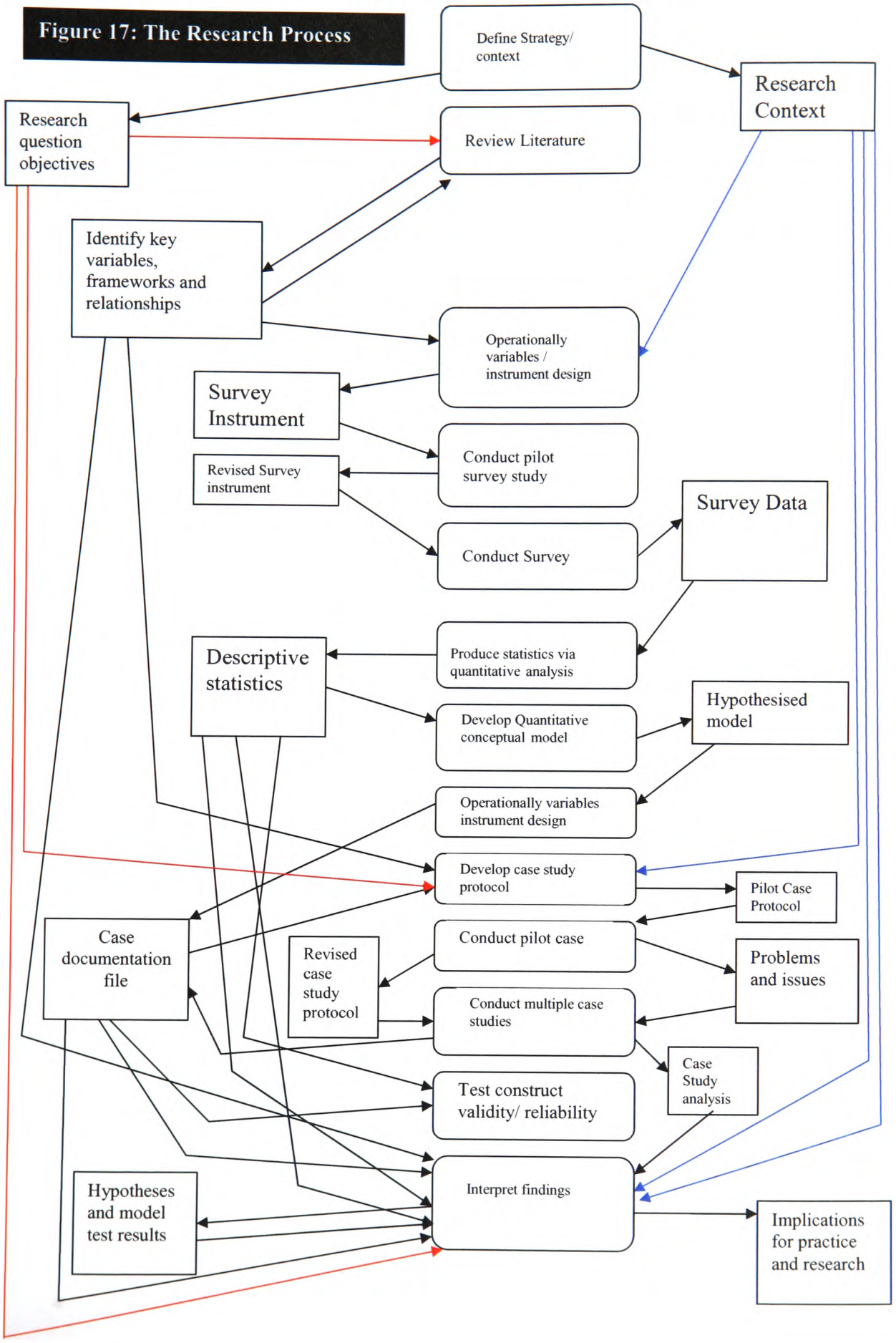
Thereafter, all questionnaires were coded and input into SPSS software. On checking for data errors by generating frequency outputs, 15 records indicated a data entry error and subsequently amended. In order to ensure validity of the data entered, every 20th record was checked, with no further errors uncovered. In terms of statistical reliability of this study any estimate based on data collected from a sample was subject to potential sampling error as it was based on one of a number of possible samples (Antonius, 2003).

The sampling error was the measurement of the variability of these estimates, otherwise known as the standard error, which allowed the construction of interval estimates with a prescribed level of confidence that the interval included the average result of all possible samples. The size of the standard error and thus the length of the confidence interval was a function of the size of the sample, its design and the estimation procedures utilised, including the variability within the whole population. This study employed a 95% confidence level for the survey data (Field, 2005). For example, the percentage of "1-9" sized enterprises that indicated no usage of IT/IS was 46%, thus there was a 95% probability that the true value lay within the range 44-48%.

4.19 Conclusion to Research Design

This chapter has outlined the research process deployed within this thesis as a sequential mixed method process comprising a quantitative, positivistic survey and a qualitatively focused longitudinal case study analysis. To illustrate E-Business usage within the SME sector, both methods enabled the identification of the significant variables and their interactions and relationships. As identified previously, Figure One provided a conceptualisation of the knowledge sources within this study in the form of a knowledge map. The diagram illustrated the key areas of enquiry identified within this study and the primary and secondary sources of information utilised to collate the relevant data and their interrelationships. Figure 17 provided a flow diagram illustrating the progression of the research process and order of events deployed within this study, as inspired by Gable (1994). In this figure, the rounded boxes represented processes or actions undertaken within this thesis. The response rates for the survey were reported within Section 4.18 and represented an adequate representation of the SME community within Wales. The following chapter will present the results of the quantitative survey undertaken within the first phase of the primary research.

Figure 17: The Research Process



Chapter 5:

Quantitative Survey of E-Business Utilisation within the SME sector

Chapter 5: Quantitative Survey of E-Business Utilisation within SME sector

This chapter presented a quantitative study of E-Business usage within SMEs in Wales. The evidence produced in this chapter provided significant evidence towards the first and second research questions stated in section 3.11. The first question involved the identification and evaluation of the key factors associated with E-Business adoption. The second evaluated the impact of E-Business on the micro-sized "Sole-Proprietor" sector to clarify understanding of the issues faced within this significant size grouping. Moreover, the chapter also provides contributory evidence towards the construction of a representative conceptualisation of the E-Business environment from the perspective of the "Sole-Proprietor" SME. The factors under investigation namely the identification of individual enterprise demographics, levels of E-Business deployment, drivers and inhibitors to adoption were contrasted by SME size classification, LA and IA to establish their degree of influence.

The chapter commenced with an overview of demographic factors such as IA and trading market to illustrate the survey population. Thereafter the utilisation of a range of E-Business technologies, including E-mail, intranets, extranets and websites were evaluated. The impact of such technologies on the enterprise was evaluated in terms of cost, income and change in trading market because of E-Business deployment. The chapter also evaluated the drivers of and barriers to adoption and benefits and problems associated with usage. A range of statistical techniques was employed to evaluate, compare and contrast the results, including reporting frequencies, percentages, ranking, means, cross-tabulations (two-way and three-way) and standard deviations. As the questionnaire contained mainly categorical data, this limited the type and extent of statistical analysis that could be deployed. Wherever possible, and to increase the comparability of the data, the SME size classification, LA and IA were cross tabulated as base comparators throughout the analysis.

Pearson's chi-square test was employed, where permissible, to assess the associations between the data (Field, 2005). In total, 72 chi-square associations were tested, utilising in the main the SME size classification as a base comparator. Several positive associations were observed, and reported throughout the chapter, where $n \geq 10$, to ensure no distortion of the analysis given the word restrictions on this thesis. The findings presented in section 5.1-5.1.10 were contrasted with previous surveys within Chapter Seven to verify usage trends and the key issues influencing E-Business usage within the SME population in Wales.

5.1 Demographic Descriptors

When the survey was analysed by business type, the "Sole-Proprietor" size sector represented 34.4% of the total respondent population. The "1-9" sized classification proved the most significant sector, contributing 44.4%, followed by the "10-49" small (14%) and the "50-249" medium-sized enterprises (7.2%) category (Table 17). In terms of representation of IA against SME size classification, Table 18 provided a breakdown of respondents. The "Sole-Proprietor" (SP) sized classification most significant IA proved to be Services/Transport (32%), followed by the Retail/Repair (21%) sector. The "1-9" sized classification main contributors proved to be the Manufacturing (18%) and Services/Transport sectors (18%). Similarly, the "10-49" group was predominantly populated by the Manufacturing (26%) and Services/Transport (15%) sectors. The respondents within the largest SME sized category, "50-249" were dominated by the Manufacturing (39%) and Services/Transport sectors 28%.

Overall, in terms of IA, the Services/Transport sector (26%) provided the most respondents, followed by Manufacturing (22%) and Retail/Repair (17%). The survey provided a broad and adequate representation of the Welsh SME community in terms of size classification and IA identified within Section 2.2, with no non-SMEs classified enterprises included. Ninety-three per cent of survey respondents' were within the "0-49"

SME size category, which equated approximately to the 99% identified with the latest SBS statistics (Table 4).

Table 18: Industry Activity by SME Size Categorisation by Percentage

Industrial Sector	SME Size by Employee Number					
	Total f	SP %	1-9 %	10-49 %	50-249 %	As a % of all sample
Agriculture/Forestry/ Fishing	11	2.4	2.7	1.4	0.0	2.0
Construction	50	14.1	8.1	9.7	2.8	10.0
Manufacturing	110	14.1	23.9	26.4	38.9	22.0
Communications/ Computing	17	1.8	5.0	2.8	2.8	3.0
Wholesaler	28	5.3	4.1	9.7	8.3	6.0
Retail/Repair	84	21.2	17.6	9.7	5.6	17.0
Finance/Insurance/ Real Estate/Legal	38	3.5	10.4	9.7	5.6	8.0
Services/Transport	129	32.4	23.9	15.3	27.8	26.0
Education	4	0.6	0.5	2.8	0.0	1.0
Health/Medical	3	0.6	0.9	0.0	0.0	1.0
Other	26	4.1	3.2	12.5	8.3	5.0
Total	n=500	34.0	44.4	14.4	7.2	100

There was an over-representation of the larger-sized SME "50-249" classification within the survey sample in contrast to the UK population, although this was useful for comparative purposes. All the IA sectors were present within the survey, with the most significant returns a representative approximation of the main UK sectors, such as Manufacturing, Construction, Services/Transport and Retail/Repair (SBS, 2003) (Table 18). Table 19 displayed the survey population of SMEs in terms of LA. Cardiff (13.4%) represented the largest contributor followed by Swansea (11.8%) and Carmarthenshire (8.8%). These returns provided an accurate representation of SME population density by LA.

Table 19: Local Authority by SME Size Categorisation by Percentage						
Local Authority	Total f	SP %	1-9 %	10-49 %	50-249 %	As a % of all sample
Ceredigion	23	4.1	5.9	4.2	0.0	4.6
Pembrokeshire	26	5.3	6.3	2.8	2.8	5.2
Carmarthenshire	44	9.4	8.6	9.7	5.6	8.8
Swansea	59	12.4	11.3	11.1	13.9	11.8
Neath Port Talbot	36	7.6	7.7	5.6	5.6	7.2
Bridgend	25	3.5	4.5	9.7	5.6	5.0
RCT	44	10.6	8.6	8.3	2.8	8.8
Merthyr Tydfil	25	2.9	6.3	5.6	5.6	5.0
Caerphilly	40	5.9	9.5	8.3	8.3	8.0
Blaenau Gwent	17	2.4	3.2	4.2	8.3	3.4
Torfaen	18	8.2	1.4	1.4	0.0	3.6
Vale of Glamorgan	33	10.0	3.6	8.3	5.6	6.6
Cardiff	67	9.4	15.3	12.5	22.2	13.4
Newport	43	8.2	8.1	8.3	13.9	8.6
Total	n=500	34.0	44.4	14.4	7.2	100

5.1.1 Traditional trading market

Survey respondents were required to identify their traditional trading markets as noted within Section 4.10.1, without the influence of E-Business. Respondents were asked to identify if they traded in:-

- Wales
- the UK outside Wales
- the EC
- a global market outside the EC.

Forty-nine per cent of survey respondents indicated that they traded within Wales only, whilst 81% identified that over 50% of their turnover was within traditional markets in Wales (Figure 18). The mean revealed a significant reliance on Wales as a trading market for SMEs, with an average of 81% and a standard deviation of 29.9%.

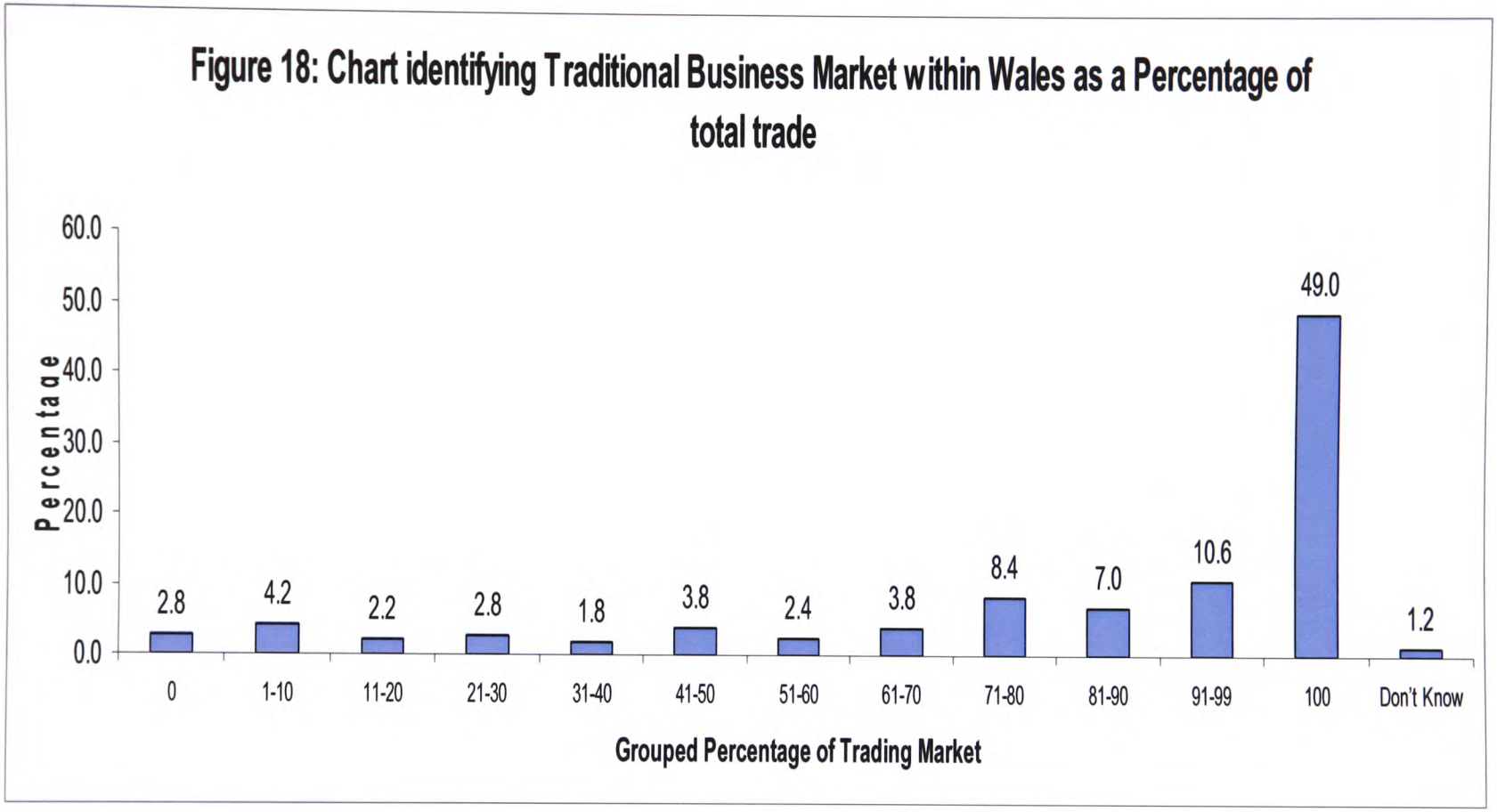


Figure 18: Chart identifying Traditional Business Market within Wales as a Percentage of total trade
Percentage
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2.8
4.2
2.2
2.8
1.8
3.8
2.4
3.8
8.4
7.0
10.6
49.0
1.2
0
1-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80
81-90
91-99
100
Don't Know
Grouped Percentage of Trading Market

When the Welsh trading market was cross tabulated by SME size classification, several trends were apparent (Figure 19), namely that micro-sized groupings placed a heavy reliance on this market, with 64% of "Sole-Proprietor", 55% of "1-9" and 34% of "10-49" sized SMEs undertaking 100% of their trade only within Wales. By combining the grouped frequencies categories, further trends emerged. Analysis revealed that 87% of "Sole-Proprietor", 92% of "1-9" and 93% of "10-49" SME size classifications did more than 50% of their trading only within Wales. By contrast, the largest SMEs size classification the "50-249" sector was less reliant on this traditional market, with only 15% of this sector trading 100% within Wales. Indeed, 43% of the "50-249", SME size sector surveyed undertook less than 30% of their trade within Wales and 19% none whatsoever.

In terms of reliance on the Welsh trading market by LA, 71% of enterprise respondents from Bridgend and 65.4% of Pembrokeshire identified that 100% of their trade was undertaken only within Wales. LAs with less reliance on Wales (less than 30% of total turnover) included Ceredigion (21.7%) and NPT (19.4%). The SMEs LAs with most reliance on a Welsh trading market included Caerphilly (95%) and Torfaen (94.4%) whereby between 50-100% of their turnover was within this market. Overall, the statistics suggested heavy reliance on a Welsh trading market, with 51% of enterprises within LAs identifying that 100% of their trade occurred within this geographical boundary.

There was less reliance on a UK trading market outside Wales. The results revealed that the majority of responding SMEs (51%) only traded within Wales. Indeed, 67% of all respondents identified less than 10% of all trade was outside Wales within a UK market (Figure 19). A mean of 15.73% and a standard deviation of 25.45%, suggested a wide range of performance. Micro-sized Welsh SMEs were not trading extensively within a UK market. For example, 62% of "Sole-Proprietor", 55% of "1-9", 30% of "10-49" and 15% of "50-249" of SMEs undertook no trade in the UK outside Wales. Overall, only 13% of "Sole-Proprietor", four per

cent of "1-9" and eight per cent of "10-49" identified undertaking over 50% of their total trade within a UK market outside Wales. Contrastingly, the "50-249" sector was extremely proactive in this market, with 42% undertaking over 50% of their trade, and only 15% not trading, in a UK market (Figure 20). When analysed by LA, 70.8% of SMEs in Bridgend, Torfaen 66.7% and Pembrokeshire 65% revealed no trade within this market. Enterprises within BG (5.9%) and Ceredigion (4.3%) revealed the greatest dependency on a UK market outside Wales with 100% of their trade occurring in this region. Swansea's SME community revealed the most significant commitment to a UK market outside Wales with 19% of their participants undertaking 50-100% of their trade within this geographical region. Caerphilly revealed the least significant dependency on this market with only 2.5% of their respondents undertaking between 50-100% of their trade within the UK and outside Wales.

When analysed by LA, 70.8% of SMEs in Bridgend, Torfaen 66.7% and Pembrokeshire 65% revealed no trade within this market. Enterprises within BG (5.9%) and Ceredigion (4.3%) revealed the greatest dependency on a UK market outside Wales with 100% of their trade occurring in this region. Swansea's SME community revealed the most significant commitment to a UK market outside Wales with 19% of their participants undertaking 50-100% of their trade within this geographical region. Caerphilly revealed the least significant dependency on this market with only 2.5% of their respondents undertaking between 50-100% of their trade within the UK and outside Wales. Analysis of trade for all respondents within a EC market, revealed minimal exploitation, with 88% of respondents identifying that they did not trade within this market and only 10% identified that up to 20% of their trade came from this area (Figure 21).

When grouping cumulative frequencies by SME size classification only 15% of "Sole-Proprietor", four per cent of "1-9" identified undertaking

up to 20% of their total trade within EC markets. The "50-249" sector demonstrated the highest level of trade within the EC, with 28% identifying trade of up to 40% of overall sales. In terms of LAs the VG 97%, Pembroke 96% and Cardiff 91% revealed least reliance on an EC market outside Wales with no trade within this geographical area. Trade within the EC was extremely marginal with only SMEs within Ceredigion revealing any usage of this market (4.3%).

Analysis of trade outside the EC within a global market revealed that 94% of all SMEs noted a zero level of global trade. In terms of SME size classification 95% of the "Sole-Proprietor", 96% of "1-9", 78% of "10-49" and 78% of the "50-249" identified zero global trade outside Europe. Only 12% of the "10-49" and 12% of the "50-249" sectors identified that global trade accounted for in excess of 30% of their overall sales (Figure 22). In terms of LAs usage of E-Business, the results revealed a consistent picture of under utilisation. Several LAs revealed a zero level of trade within this sector (Pembroke and Torfaen) and the average performance was for 93% of SMEs not trading within this geographical region. Bridgend (four per cent) and Merthyr (four per cent) LAs produced the highest levels of performance within a global market for SMEs with between 50-100% of the trade within this geographical region.

When the trading market was contrasted using a grouped frequency cross-tabulation against IA, the following trends emerged (Appendix I). Seventy-six per cent of the Construction and 73% of Agriculture/Forestry/Fishing enterprises surveyed undertook all trade within Wales. The Communications/Computing and Manufacturing sectors were least reliant on trade within Wales, with 23% and 6% respectively undertaking no trade within this region.

Figure 19: Chart of traditional trading market in Wales cross tabulated by SME Size Classification by Percentage

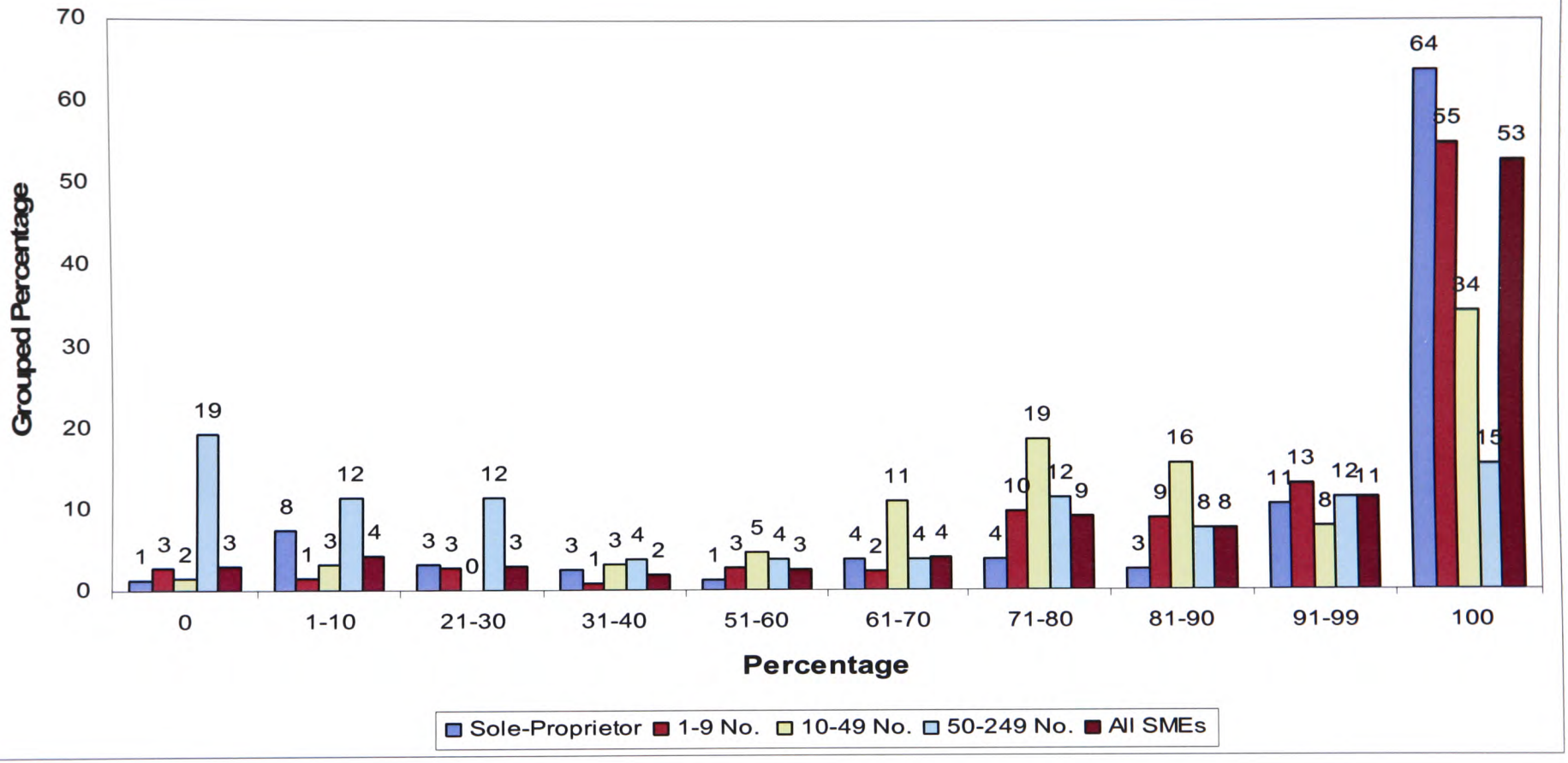


Figure 20: Chart of traditional market in UK cross tabulated by SME Size classification by Percentage

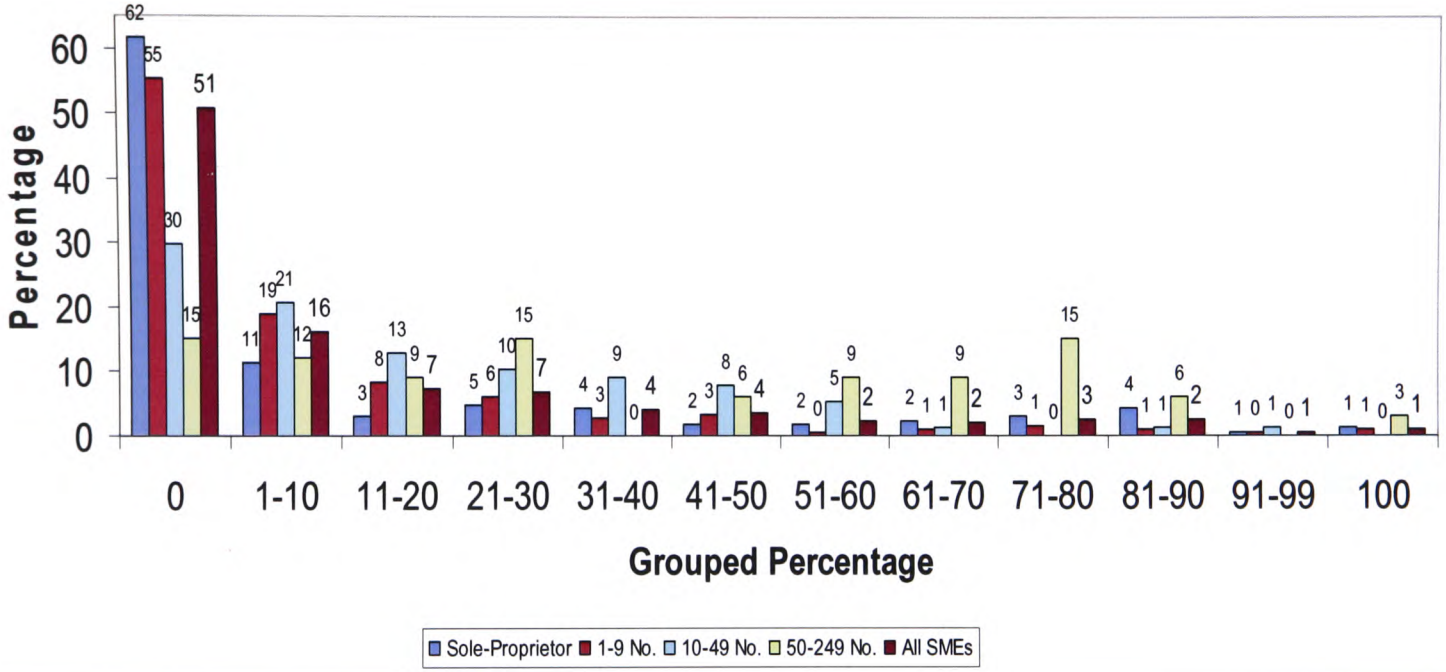


Figure 21: Chart by Percentage of traditional market in EC cross tabulated by SME size classification

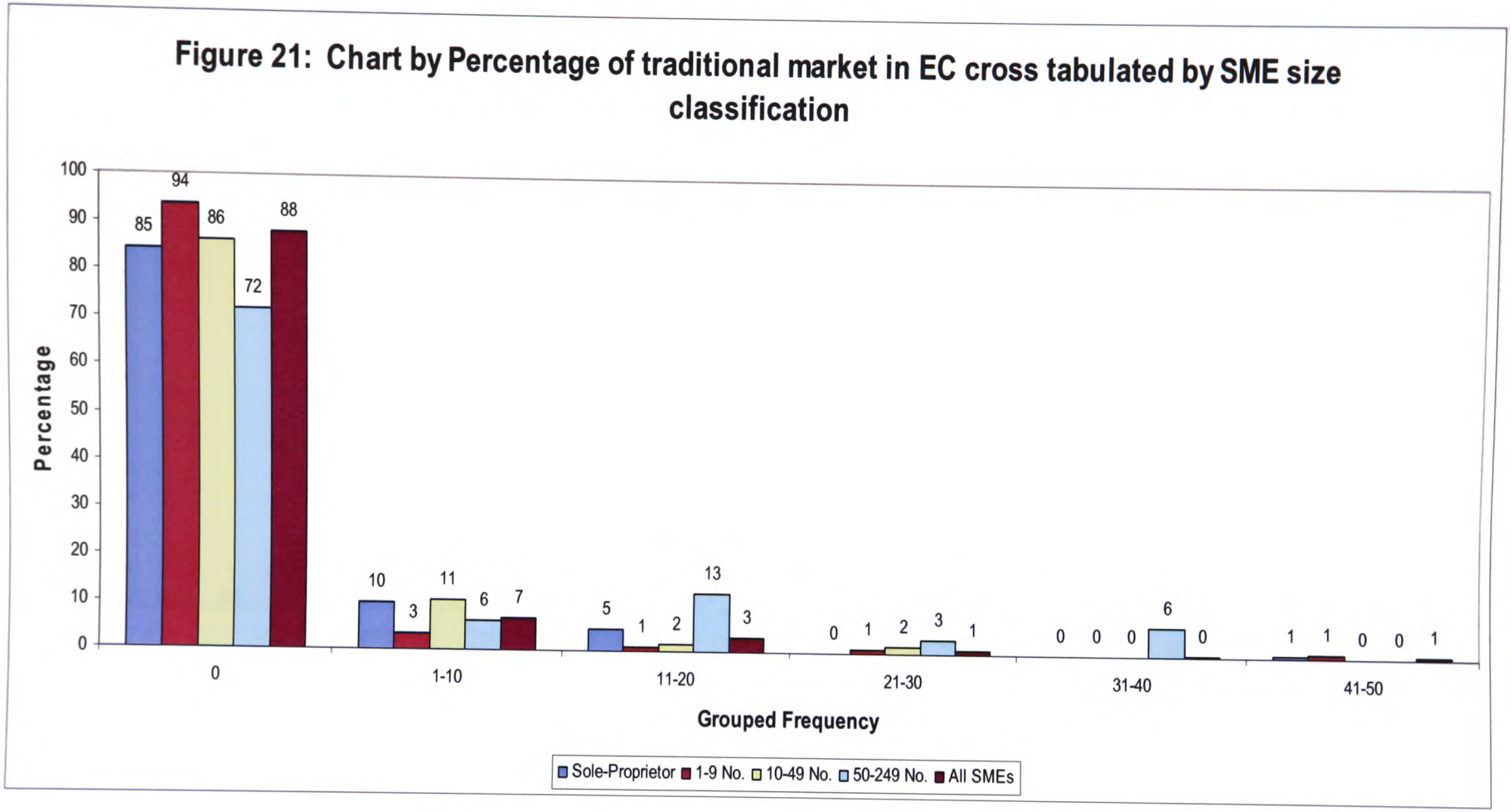
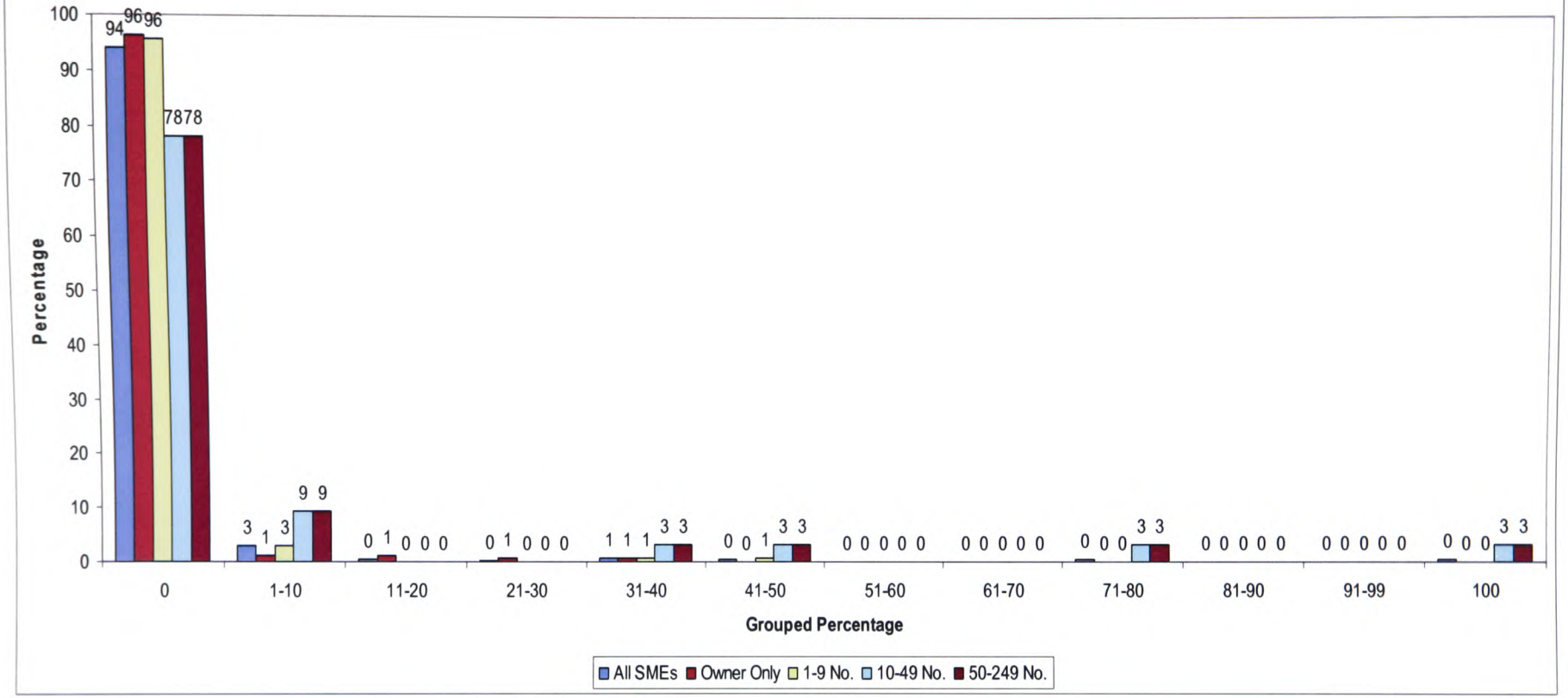


Figure 22: Chart by Percentage of traditional market in Global Market cross tabulated by SME Size classification



In terms of UK trade outside Wales, 50% of the Finance/Insurance/Real Estate/Legal and 17% of the manufacturing sector identified that over 50% of their trade occurred within this market. Other sectors performed poorly in terms of UK trade outside Wales, including the majority of the Agriculture/Forestry/Fishing (72%), Construction (76%) and Retail/Repair (66%) sectors, which identified no trade within this market. In terms of EC trade, all industry sectors performed poorly, with no EU trade identified in 72% of Agriculture/Forestry/Fishing, 76% of Construction and 66% of all Retail/Repair survey respondents. High levels of activity were minimal, with only one enterprise from the Communications/Computing sector reporting 100% of its trade within the EC. Evidence of global trade was also insignificant, with several sectors identifying no trade presence (Construction and Agriculture/Forestry/Fishing), and the Retail/Repair (98%) and Wholesaler (96%) sectors were virtually non-existent in this theatre.

In summary, the majority of the traditional trading patterns of the SME community within Wales were dominated by excessive reliance on local and regional trading markets, with minimal exploitation of the UK, EU and global markets. This trend was particularly prevalent within "Sole-Proprietor" and "1-9" SME micro-sized classifications. Analysis of trading patterns by LAs confirmed the limited exploitation of markets outside Wales although there was no consistent behaviour pattern. Within the industry sectors, the more traditional primary and manufacturing type industries, such as Construction and Agriculture/Forestry/Fishing, demonstrated the weakest performance in terms of exploitation of markets outside Wales, whilst the largest SME size classifications demonstrated higher level of trade within European and global markets, this was the exception rather than the rule.

This evidence suggested that there were potential new markets, which SMEs could exploit through E-Business. To successfully exploit E-Business, SME Owner/Managers must strategically deploy E-Business

and regularly evaluate its effectiveness to ensure successful usage occurred. The evidence identified within the literature in section 3.4 suggested that this was not the case. The survey population was representative of the SME population in Wales and therefore the findings were generalisable to the E-Business SME community. The next section considered the utilisation of E-Business within the SME community. The evidence therefore suggested that Welsh micro-sized classified SMEs did not use E-Business to move outside existing local trading markets.

5.1.2 Levels of IT/IS utilisation

Overall (Table 20), IT/IS utilisation revealed a limited usage by respondents of the more sophisticated E-Business technologies in contrast to basic technologies. Forty-five per cent identified using one or more PCs and seven per cent a basic LAN. Twelve per cent claimed usage of a LAN on a server, three per cent utilised several servers, whilst four per cent operated a number of LANs and WANs. However, 29% of enterprises surveyed did not use any form of IT/IS, this being most significant within the "Sole-Proprietor" and "1-9" SME micro-sized classifications, with 46% for each category noting no usage. Therein, the Construction (44%) and Retail/Repair (51%) sectors recorded the lowest levels of technology utilisation.

IT/IS usage within the micro-sized SME classifications ("Sole-Proprietor" and "1-9") was largely limited (46% in both classifications) to the usage of one or more PCs running application software. Usage of networks was extremely limited, with only four per cent of the "Sole-Proprietor" and "1-9" sector utilising a network and one per cent a server. The "10-49" sector displayed significant usage of LANs (24%), and servers (eight per cent), with six per cent utilising WANs. The "50-249" sector demonstrated the highest usage levels of more advanced IT/IS technologies, with 36% utilizing LANs, 17% servers and 36% WANs.

Table 20: Usage levels of IT/IS by SME Classification by Percentage

	Overall		% by Enterprise size			
	f	%	SP %	1-9 %	10-49 %	50-249 %
Do not use IT/IS	143	28.7	45.9	25.8	8.3	5.6
Use 1 PC running software	145	29.1	39.4	30.8	13.9	0.0
More than 1 PC running software	82	16.4	10.0	19.5	27.8	5.6
Number of PCs sharing a printer over LAN	35	7.0	3.5	9.0	12.5	0.0
LAN of PCs sharing applications on server	60	12.0	1.2	12.7	23.6	36.1
LAN of PCs sharing applications on several servers	13	2.6	0.0	0.5	8.3	16.7
Have number of LANs and WANs of PCs	21	4.2	0.0	1.8	5.6	36.1
Total Respondents	n=499					100%

When assessed by IA, significant trends were apparent. Of those enterprises that did not use IT/IS the most significant sectors by IA were Construction (44% of all such enterprises), Services/Transport (33.3%) and Retail/Repair (50.6%). Enterprises within these sectors could be considered more traditional in terms of IA, with less reliance on sophisticated levels of IT/IS. Lower levels of technology, e.g. use of a PC running application software, was prevalent within the Wholesaler (50%), Retail/Repair (30%), Agriculture/Forestry/Fishing (54.5%) and Services/Transport (34.1%) sectors. Evidence of sophisticated IT/IS usage was limited, with only 12% of total survey respondents using a LAN and a server, 2.6% LANs using multiple servers, 4.2% LANs and WANs.

When analysed by SMEs LA geographical classification, Pembroke 38.5% and Ceredigion 34.8% identified no usage of IT whatsoever. A high level of IT utilisation with usage of several LAN and WANs was identified in 12% of SMEs in Bridgend and nine per cent within Cardiff. Use of such technologies was recorded as minimal in LAs such as

Torfaen (zero per cent), Caerphilly (2.5%) and RCT (2.3%). When analysed by IA, the most prevalent sectors for sophisticated IT/IS use included the Communications/Computing (29.4% LANs and server, 11.8% LANs and servers, 11.8% LANs and WANs), and the Finance/Insurance/Real Estate/Legal scored highly in use of a LAN (18.4%). Such business sectors were typically more reliant on higher levels of IT/IS as a key component of their day-to-day operational working practices. Perhaps a confirmation of the aspirations and ambitions was that 69% of enterprises within the sample which traded solely within Wales did not use any form of IT/IS. This statistic suggested a lack of ambition for SMEs trading only within local markets.

When asked what percentage of staff employed within the enterprise utilised any form of IT/IS during everyday activities on a daily basis, 32% of all survey respondents (n=500) identified up to a quarter of staff, 11% up to a half, five per cent three-quarters and 24% more than three-quarters (Figure 23). Twenty seven per cent of respondents identified that IT/IS was not applicable to their business. These statistics were high, given the limited exploitation of IT/IS within the overwhelming majority of SMEs surveyed. Such a statistic suggested that enterprises that were utilising IT/IS were exploiting it within everyday business operations. When the various SME size classifications were contrasted, the level of high usage within the "Sole-Proprietor" size sector was significant, with 48% identifying that more than three quarters of their staff were daily users of IT/IS.

Within the larger-SME size classifications ("1-9" 47%, "10-49" 57%, "50-249" 47%), the most significant usage identified only a quarter of staff using IT/IS on a daily basis. This statistic can be explained by the presence of specialist IS/IT staff within the larger-SME size classifications and, by contrast, the necessity for all personnel within the micro-sized SME classifications ("Sole-Proprietor", "1-9") to multi-task, acquire IT/IS skills expertise and be involved in the everyday operational processes of the enterprise. When organisational usage of IT/IS was

evaluated by prime IA, a range of usage commitment was evident (Table 21).

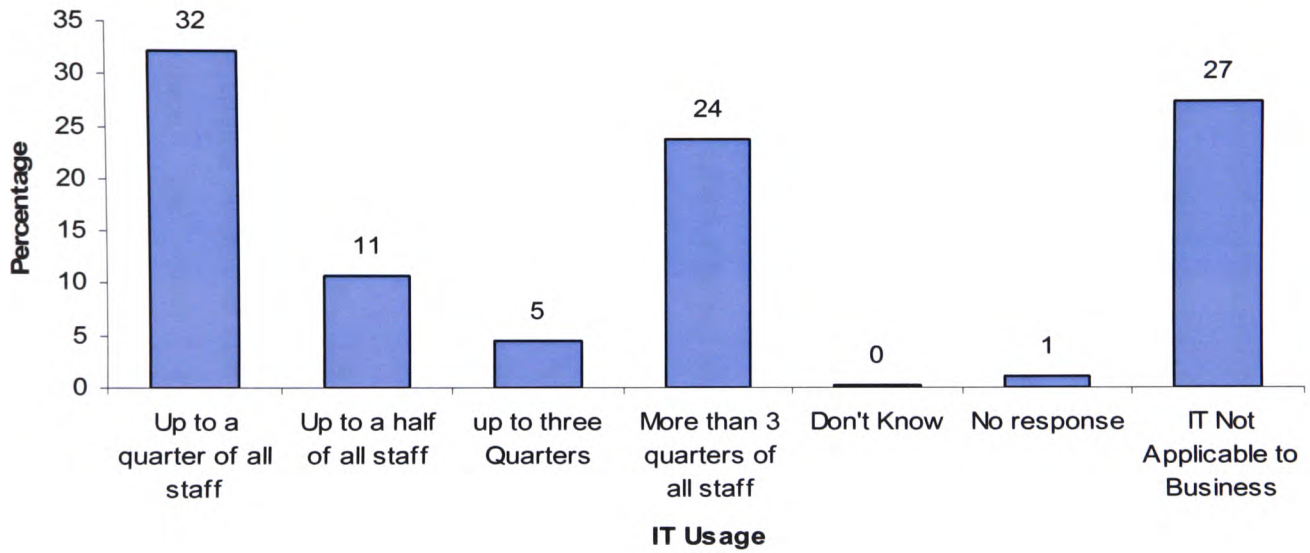
The Manufacturing (69%), Construction (69%) and Agriculture/Forestry/Fishing (67%) IA sectors identified committing only up to a quarter of their employees to IT/IS usage on a daily basis. The business sectors most committed with more than three quarters of personnel using IT/IS on a daily basis included Communications/Computing (100%) and Finance/Insurance/Real Estate/Legal (53%). In terms of SMEs within LA, Torfaen (46.2%) and MT (45%) identified committing more than three quarters of enterprise personnel to IT/IS activities on a daily basis.

Least committed in terms of staff time were BG (64%), Caerphilly (57%) and NPT (52%) with only up to a quarter of their personnel using IT/IS usage on a daily basis. Again these statistics suggest a lack of utilisation of basic IT/IS especially within the micro-sized and more traditional IA sectors.

Table 21: Employee's using IT/IS on a Daily Basis by Business Activity by Percentage

Sector	Up to a Quarter %	Up to a half %	Up to three Quarters %	More than Three quarters %	Don't Know %	No Response %
Agriculture/Forestry/ Fishing	66.7	0.0	0.0	22.2	0.0	11.1
Construction	69.0	0.0	6.9	20.7	3.5	0.0
Manufacturing	69.3	18.2	2.3	10.2	0.0	0.0
Communications/ Computing	0.0	0.0	0.0	100.0	0.0	0.0
Wholesaler	24.0	24.0	12.0	40.0	0.0	0.0
Retail/Repair	38.1	14.3	9.5	38.1	0.0	0.0
Finance/Insurance/Real Estate/ Legal	10.5	13.2	21.1	52.6	0.0	2.6
Services/Transport	45.4	19.8	1.2	31.4	0.0	2.3
Education	0.0	0.0	0.0	100.0	0.0	0.0
Health/Medical	100.0	0.0	0.0	0.0	0.0	0.0
Other	27.3	18.2	13.6	36.4	0.0	4.6

Figure 23: Staff usage of IT/IS on a daily basis



Seventy two per cent of (n=362) all survey respondents identified their Internet access status of which 79% indicated that they accessed the Internet within their enterprise. Higher levels of utilisation were recorded within larger-sized SME classifications ("50-249", 97%, "10-49", 91%) in contrast to the micro-sized enterprises ("1-9", 82% and "Sole-Proprietor", 66%). The survey identified that 57% of all survey respondents (n=500) had Internet access (Table 22). When analysed by SME size classification, it was discovered that micro-sized SMEs ("Sole-Proprietor" and "1-9") had less Internet access than larger-sized enterprises (Table 22). For example, the "Sole-Proprietor" sized sector identified 36.5%, whereas 58% of the "1-9" classification had access to the Internet. By contrast, the larger-sized SME classifications demonstrated far higher levels of Internet connectivity ("10-49", 86% and "50-249", 92%).

When analysed by LA of the SME respondents with Internet access, the MT (95%) and VG (91%) LAs identified the highest level of Internet access whilst 61.5% of SMEs in Torfaen reported no Internet access. Such statistics were amplified when the entire survey population was taken into account. There within MT (76%), RCT (64%) and the VG (64%) reported the highest level of Internet access whilst Torfaen the least with 28%. As previously, the micro-sized SME classification underperformed in comparison to their larger counterparts.

In terms of the method of Internet connection, 23% of respondents identified employing a dial up analogue modem, 30% a broadband connection (including ADSL), Digital Subscriber Line (DSL), wireless, cable, satellite) and three per cent ISDN. The Communications/Computing (85%) and Finance/Insurance/Real Estate/Legal (73%) IA sectors reported the highest levels of broadband connectivity, whilst the Construction sector (53%) recorded the lowest.

Table 22: Internet Access by SME Size by Employee Number as a Percentage						
			Percentage by Enterprise Size			
Factor	f	%	SP %	1-9 %	10-49 %	50-249 %
Yes, Enterprise had Internet access	286	57.2	36.5	58.1	86.1	91.7
No, Enterprise did not have Internet access	76	15.2	18.8	16.7	8.3	2.8
Not Eligible for Question	138	27.6	44.7	25.2	5.6	5.6
Total Respondents	n=500		100%			

The majority of SMEs had access to a broadband connection, with the ongoing decline of dial up Internet service providers (ISPs). This evidence indicated that SMEs were making significant usage of the increased availability of Internet broadband connectivity (eCIC, 2005). A positive association was established between enterprise size classification and Internet access through a chi-square association test (χ^2 = 22.570, $p<0.001$ Appendix H – Table One).

In terms of IA, 100% of the Communications/Computing enterprises identified Internet access. Least access was reported in the Wholesaler (52%), Manufacturing (77%) and Agriculture/Forestry/Fishing (77%) sectors. This result suggested that enterprise size was an important determinant in successfully establishing an Internet connection with significantly higher levels of utilisation and connection within larger-sized SME classifications. Moreover, IA was another determinant of level of IT/IS deployment, with higher levels consistently reported in certain sectors (e.g. Communications/Computing) in contrast to others. These usage trends were reflected in E-mail usage statistics (Table 23), whereby 66% of all question respondents (n=363) identified uptake, with higher level of utilisation recorded within larger-sized SME classifications ("50-249", 97%, "10-49", 78%) in contrast to the micro-sized enterprises ("1-9", 59% and "Sole-Proprietor", 56%). In terms of the overall survey population (n=500) this represented 47.6% of the total survey population which comprised 31.2% of "Sole-Proprietor", 44.6%

of "1-9", 73.6% of the "10-49" and 91.7% of the "50-249" (Table 23). As might be expected the micro-sized enterprises utilised significantly less technology than their larger-sized counterparts did.

The Communications/Computing (100%), Finance/Insurance/Real Estate/Legal (86%) and Manufacturing (81%) sectors reported the highest levels of E-mail usage. By contrast, the Agriculture/Forestry/Fishing (71%) and Construction (71%) sectors identified the lowest levels of uptake. The highest levels of SME utilisation of E-mail by LAs were recorded within Newport (74%), Ceredigion (73%) and BG (73%). The lowest levels of SME usage were prevalent within Torfaen 61% and thereafter Carmarthenshire (41%) and RCT (41%). When the response rates was considered as a proportion of the entire survey population MT (56%), Newport (54%) and Cardiff (52%) recorded the highest levels of E-mail utilisation and Torfaen (28%) and Pembrokeshire (42%) the lowest.

Table 23: E-mail Usage by SME Size by Employee Number as a Percentage

			Percentage by Enterprise Size			
Factor	f	%	SP %	1-9 %	10-49 %	50-249 %
Yes Enterprise had E-mail access	238	47.6	31.2	44.6	73.6	91.7
No Enterprise did not have E-mail access	125	25.0	24.1	30.6	20.8	2.8
Not Eligible for Question	137	27.4	44.7	24.8	5.6	5.6
Total Respondents	n=500		100%			

A chi-square test revealed an association between the variables 'E-mail usage' and 'SME size classification' ($\chi^2 = 25.981$, $p<0.001$ Appendix H – Table Two). This association suggested that the larger-sized classifications of SME were more likely to utilise E-mail than the micro-sized SME enterprises. This was a natural association, given that larger-sized SMEs were likely to have access to greater resources and be more

technologically advanced as confirmed by the prior literature in section 3.8.

Two hundred and eighty seven respondents identified if they possessed an organisational website, which represented 57% of the total survey population. Of these question respondents (n=287), 56.8% identified website ownership whilst 42.8% did not. By respondents (n=287) this comprised 45.3% of "Sole-Proprietor", 55% of "1-9", 52.5% of the "10-49" and 94% of the "50-249" sector. As might be expected the larger-sized SME classifications witnessed higher levels of website utilisation. In terms of the overall survey population (n=500) this represented 32.6% of the total survey population which comprised 17.1% of "Sole-Proprietor", 31.5% of "1-9", 44.4% of the "10-49" and 88.9% of the "50-249" (Table 24). As might be expected the micro-sized enterprises utilised significantly less technology than their larger-sized counterparts.

Table 24: Organisation Usage of Website by SME Size as a Percentage

			Percentage by Enterprise Size			
Factor	f	%	SP %	1-9 %	10-49 %	50-249 %
Yes have a Website	163	32.6	17.1	31.5	44.4	88.9
No do not have a Website	124	24.8	20.6	26.1	40.3	5.6
Not Eligible for Question	213	42.6	62.4	42.3	15.3	5.6
Total Respondents	n=500		100%			

Website usage was more prominent within larger-sized SME classifications. A chi-square test revealed an association between SME size classification and website ownership ($\chi^2 = 23.439$, $p<.001$ Appendix H – Table Three). In terms of website ownership by IA, the most prominent sectors were Communications/Computing (94%) and Manufacturing (62%). Least prevalent, in terms of website ownership was the Agriculture/Forestry/Fishing (29%), Finance/Insurance/Real

Estate/Legal (39%) and the Wholesaler (43%) categories. In terms of SME usage of websites by LA (n=287) the most significant users were SMEs within NPT 76%, Swansea 72% and Cardiff 69% which as major centres of population was an expected response. The LAs (n=287) with the lowest response rate were Torfaen (0%), RCT 36% (only five respondents) and Pembrokeshire with 46%. When the full survey population (n=500) was considered the results were repeated although with a significantly lower level of uptake with NPT 44%, Cardiff 40% and Swansea 39% reporting the highest utilisation levels. LAs from Objective One areas of Wales again reported the lowest usage of website deployment with Torfaen (Nought per cent), Pembrokeshire (23%) and BG (29%).

EDI facilities were recorded within seven per cent of survey respondents. As previously, usage levels within larger-sized enterprises were proportionately higher than within micro-sized enterprises, with the "Sole-Proprietor" (one per cent) and the "1-9" (three per cent) sectors only recording minimal uptake in comparison to the "10-49" (17%) and "50-249" (33%) sectors. In terms of IA, no sector was particularly prevalent in EDI usage. Levels of sophisticated E-Business technologies were disappointing, with only two per cent of respondents identifying usage of an extranet, five per cent intranet, one per cent groupware and two per cent video conferencing. These technologies were the preserve of the larger-sized SME classifications, which was understandable given the greater financial and human resources available within such enterprises.

5.1.3 Usage of the Internet

Figure 24 identified that the Internet was used for E-mail communication (47%), finding information (52%), advertising and marketing (27%) and purchasing from suppliers (21%) (Table 25).

Table 25: Organisation use of the Internet by SME Size as a Percentage						
			Percentage by Enterprise Size			
Factor	f	%	SP %	1-9 %	10-49 %	50-249 %
Yes use for E-mail	235	47.0	29.4	46.4	73.6	80.6
Don't use for E-mail	56	11.2	8.2	12.6	12.5	13.9
Not eligible for question	209	41.8	62.4	41.0	13.9	5.6
Yes use for finding information	259	51.8	31.8	52.7	79.2	86.1
No do not use for finding information	32	6.4	5.9	6.3	6.9	8.3
Not eligible for question	209	41.8	62.4	41.0	13.9	5.6
Yes used for advertising	137	27.4	16.5	25.2	41.7	63.9
No not used for advertising	153	30.6	21.2	33.3	44.4	30.6
Not eligible for question	210	42.0	62.4	41.4	13.9	5.6
Yes used for entertainment purposes	30	6.0	5.9	7.2	4.2	2.8
No not used for this purpose	259	51.8	31.8	50.9	81.9	91.7
Not eligible for question	211	42.2	62.4	41.9	13.9	5.6
Yes used for purchasing	106	21.2	11.2	24.3	30.6	30.6
Not used for purchasing	183	36.6	26.5	33.8	55.6	63.9
Not eligible for question	211	42.2	62.4	41.9	13.9	5.6
Yes used for sales	49	9.8	4.1	8.1	18.1	30.6
Not used for sales	240	48.0	33.5	50.0	68.1	63.9
Not eligible for question	211	42.2	62.4	41.9	13.9	5.6
Total Respondents	n=500		100%			

Less significance was apportioned to the use of the Internet for online sales (10%). In terms of enterprise size classification, there was a higher level of usage identified within larger SME classifications ("10-49" and "50-249") for E-mail, finding information, advertising, purchasing and sales. The "Sole-Proprietor" SME classifications had a significantly inferior Internet usage in contrast to the other groupings in E-mail, finding information, advertising, purchasing and sales. Table 26 evaluated the SME usage of the Internet by LA. In terms of E-mail deployment, average usage was reported at 47% and best performing LAs were MT 60%, Cardiff 54%, VG 52% and Newport 51%. The worst performing LAs were identified as Torfaen 22%, BG 35% and Bridgend 40%. In terms of SMEs using the Internet for findings information the most prevalent within LAs were MT (64%), VG (58%) and NPT (56%%). The least prevalent were Torfaen 28%, Bridgend 44%

and BG 47%. Usage of the Internet for advertising purposes by SMEs within LAs was identified at 27% for all participants.

Best performing LAs were NPT 39%, VG 36% and Swansea 36%. Worst performing regions were Torfaen six per cent, Pembroke 12% and Ceredigion 17%. Use of the Internet for entertainment purposes proved marginal with only six per cent of SMEs identifying usage. RCT (11%) identified the highest utilisation with Torfaen noting no take up. When asked if they used the Internet for purchasing purposes, 21% of all SMEs answered positively of which Caerphilly (30%), BG (29%) and Newport (28%) were the best performing and Ceredigion (nine per cent) and VG (nine per cent) the worst performing. In terms of usage of the Internet for sales, Swansea (20%) and Caerphilly (16%) identified the highest level of usage whilst MT and Torfaen no uptake.

Table 27 identified Internet usage by IA. In terms of E-mail usage, the Communications/Computing (100%) sector scored highest followed by Education (75%) and Other (65%). Worst performance was reported in the Retail/Repair (29%) and Construction industries. In terms of using the Internet for finding information, the Communications/Computing (100%) Finance/Insurance/Real Estate/Legal (84%) and Agriculture/Forestry/Fishing sectors reported the highest levels of usage whilst the Retail/Repair (30%) and the Construction (40%) the lowest. The Communications/Computing (65%) sector reported the highest rating of using the Internet for advertising whilst the Retail/Repair (14%) and Construction (16%) recorded the lowest. Use of the Internet for entertainment purposes was minimal with the exception of the Communications/Computing (35%) industry. The use of the Internet for purchasing varied considerably between sectors.

The Communications/Computing (65%) reported the highest levels of uptake whilst the Construction (six per cent) and Retail/Repair (13%) sectors the lowest. The Communications/Computing (41%) reported the

highest levels of Internet deployment for online sales whilst the Services/Transport (five per cent) and Finance/Insurance/Real Estate/Legal (five per cent) the lowest. Overall, in the six uses of the Internet evaluated the Communications/Computing section sector reported the highest level of usage in five of the categories.

This was undoubtedly a reflection of the high level of E-Business typically utilised in enterprises within this industry. Contrastingly, the Retail/Repair and Construction industries demonstrated the lowest levels of uptake of the Internet which was a reflection of the low levels of technology utilised within such industries.

5.1.4 Website development

SMEs were asked to identify the origin of their website. In total, 165 of the 500 survey population (33%) identified website ownership. Of these, 44% identified an in-house development, whilst 41% had employed a specialist web design organisation, and a further (six per cent) had benefited from an E-Business initiative. When analysed by SME size classification, reliance on in-house development was most significant in the "Sole-Proprietor" (44%) and "1-9" (51%) size groupings. Thereafter, these SME size classifications were reliant on a web design enterprise ("Sole-Proprietor", 40% and "1-9", 39%).

There was less dependence on in-house website development with the "10-49" (32%) grouping, but increased dependence thereafter within the "50-249" grouping (43%). This could be attributed to the potential availability of employees with IT/IS expertise who could be entrusted with the responsibility of developing and maintaining a website. Usage of web design enterprises remained significant within the "10-49" and "50-249" SME groupings. There was minimal reliance placed on alternatives, with the exception of E-Business initiatives and projects with the "Sole-Proprietor" (eight per cent) sized classification.

Figure 24: Enterprise use of the Internet by SME Size classification as a Percentage

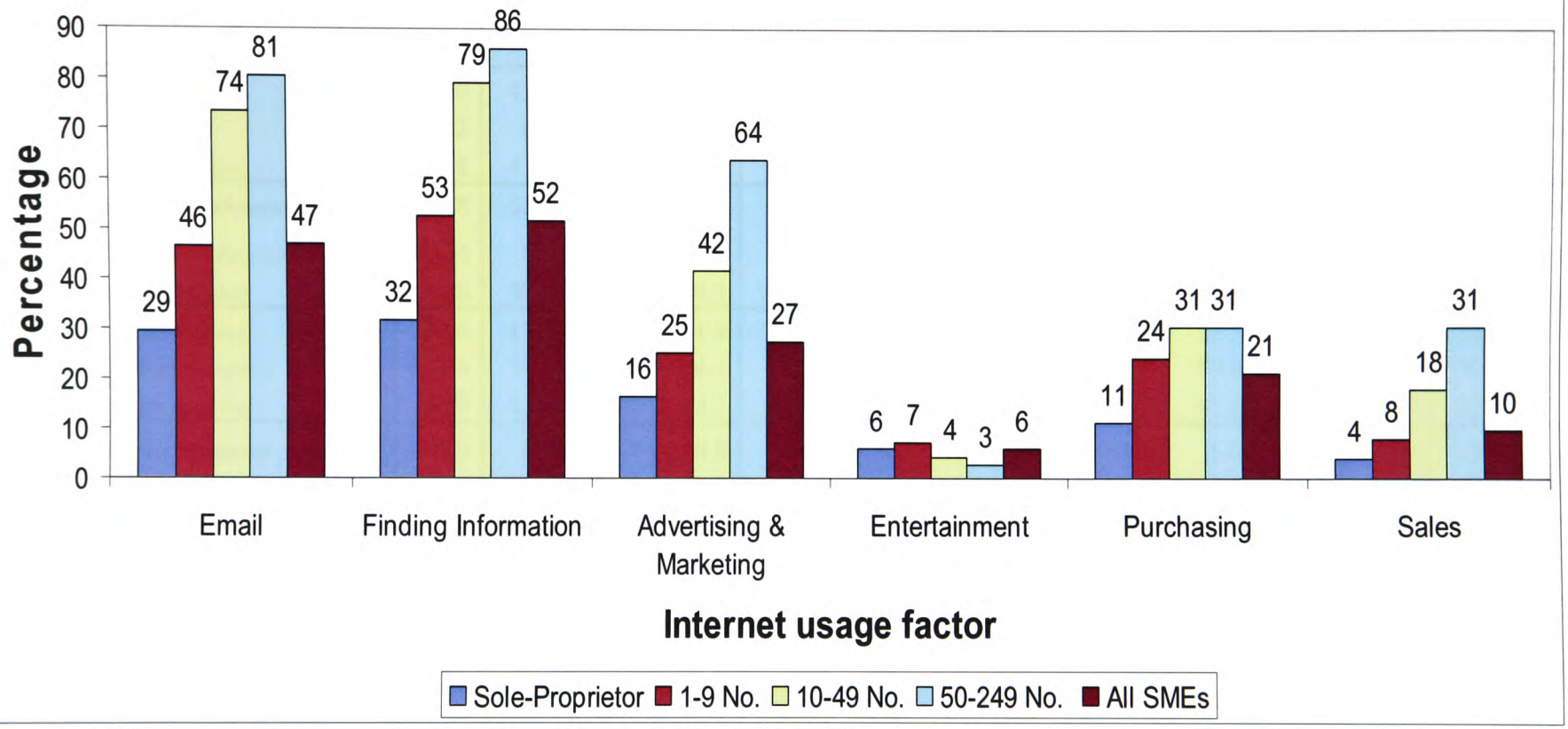


Table 26: Organisation use of the Internet by Local Authority as a Percentage

Factor	All	Ceredigion	Pembroke	Carmarthenshire	Swansea	NPT	Bridgend	RCT	MT	Caerphilly	BG	Torfaen	VG	Cardiff	Newport
Yes use for E-mail	47.0	43.5	46.2	45.5	42.4	52.8	40.0	45.5	60.0	47.5	35.3	22.2	51.5	53.7	51.2
Don't use for E-mail	11.2	8.7	3.8	20.5	11.9	5.56	20.0	18.2	16.0	5.0	17.6	5.6	15.2	6.0	7.0
Not eligible for question	41.8	47.8	50.0	34.1	45.8	41.7	40.0	36.4	24.0	47.5	47.1	72.2	33.3	40.3	41.9
Yes use for finding information	51.8	52.2	50.0	54.5	50.8	55.6	44.0	54.5	64.0	47.5	47.1	27.8	57.6	50.7	53.5
No do not use for finding information	6.4	0.0	0.0	11.4	3.4	2.78	16.0	9.1	12.0	5.0	5.9	0.0	9.1	9.0	4.7
Not eligible for question	41.8	47.8	50.0	34.1	45.8	41.7	40.0	45.5	24.0	47.5	47.1	72.2	33.3	40.3	41.9
Yes used for advertising	27.4	17.4	11.5	31.8	35.6	38.9	28.0	22.7	32.0	22.5	23.5	5.6	36.4	29.9	23.3
No not used for advertising	30.6	34.8	38.5	34.1	18.6	19.4	32.0	40.9	44.0	30.0	29.4	22.2	30.3	28.4	34.9
Not eligible for question	42.0	47.8	50.0	34.1	45.8	41.7	40.0	36.4	24.0	47.5	47.1	72.2	33.3	41.8	41.9
Yes used for entertainment purposes	6.0	0.0	7.7	6.8	8.5	5.56	4.0	11.4	8.0	5.0	5.9	0.0	3.0	6.0	4.7
No not used for this purpose	51.8	52.2	42.3	56.8	45.8	52.8	56.0	52.3	68.0	47.5	47.1	27.8	63.6	52.2	53.5
Not eligible for question	42.2	47.8	50.0	36.4	45.8	41.7	40.0	36.4	24.0	47.5	47.1	72.2	33.3	41.8	41.9
Yes used for purchasing	21.2	8.7	26.9	11.4	25.4	22.2	20.0	27.3	24.0	30.0	29.4	11.1	9.1	17.9	27.9
Not used for purchasing	36.6	43.5	23.1	52.3	28.8	36.1	40.0	36.4	52.0	22.5	23.5	16.7	57.6	40.3	30.2
Not eligible for question	42.2	47.8	50.0	36.4	45.8	41.7	40.0	36.4	24.0	47.5	47.1	72.2	33.3	41.8	41.9
Yes used for sales	9.8	8.7	7.7	15.9	20.3	8.33	8.0	2.3	0.0	10.0	17.6	0.0	9.1	9.0	9.3
Not used for sales	48.0	43.5	42.3	47.7	33.9	50.0	52.0	61.4	76.0	42.5	35.3	27.8	57.6	49.3	48.8
Not eligible for question	42.2	47.8	50.0	36.4	45.8	41.7	40.0	36.4	24.0	47.5	47.1	72.2	33.3	41.8	41.9

Table 27: Organisation use of the Internet by IA as a Percentage

Factor	All	Agriculture/Forestry/Fishing	Construction	Manufacturing	Communications/Computing	Wholesaler	Retail/Repair	Finance/Insurance/	Services/Transport	Education	Health/Medical	Other
Yes use for E-mail	47.0	45.5	30.0	50.0	100.0	35.7	28.6	81.6	45.0	75.0	0.0	65.4
Don't use for E-mail	11.2	18.2	12.0	11.8	0.0	14.3	7.1	13.2	11.6	25.0	66.7	7.7
Not eligible for question	41.8	36.4	58.0	38.2	0.0	50.0	64.3	5.3	43.4	0.0	33.3	26.9
Yes use for finding information	51.8	63.6	40.0	52.7	100.0	42.9	29.8	84.2	50.4	100.0	33.3	69.2
No do not use for finding information	6.4	0.0	2.0	9.1	0.0	7.1	6.0	10.5	6.2	0.0	33.3	3.8
Not eligible for question	41.8	36.4	58.0	38.2	0.0	50.0	64.3	5.3	43.4	0.0	33.3	26.9
Yes used for advertising	27.4	27.3	16.0	31.8	64.7	25.0	14.3	28.9	26.4	75.0	33.3	46.2
No not used for advertising	30.6	36.4	24.0	30.0	35.3	25.0	21.4	65.8	30.2	25.0	33.3	26.9
Not eligible for question	42.0	36.4	60.0	38.2	0.0	50.0	64.3	5.3	43.4	0.0	33.3	26.9
Yes used for entertainment purposes	6.0	9.1	4.0	2.7	35.3	7.1	3.6	5.3	3.9	50.0	33.3	11.5
No not used for this purpose	51.8	54.5	36.0	59.1	64.7	42.9	32.1	89.5	51.9	50.0	33.3	61.5
Not eligible for question	42.2	36.4	60.0	38.2	0.0	50.0	64.3	5.3	44.2	0.0	33.3	26.9
Yes used for purchasing	21.2	27.3	6.0	19.1	64.7	28.6	13.1	44.7	18.6	50.0	0.0	23.1
Not used for purchasing	36.6	36.4	34.0	42.7	35.3	21.4	22.6	50.0	37.2	50.0	66.7	50.0
Not eligible for question	42.2	36.4	60.0	38.2	0.0	50.0	64.3	5.3	44.2	0.0	33.3	26.9
Yes used for sales	9.8	9.1	4.0	12.7	41.2	10.7	9.5	5.3	4.7	50.0	0.0	15.4
Not used for sales	48.0	54.5	36.0	49.1	58.8	39.3	26.2	89.5	51.2	50.0	66.7	57.7

Not eligible for question	42.2	36.4	60.0	38.2	0.0	50.0	64.3	5.3	44.2	0.0	33.3	26.9

When website development was analysed by industrial sector, in-house development featured significantly in the Communications/Computing (94%) sector, but was less prevalent in the Construction (54%) and Manufacturing (43%) sectors. Deployment of a specialist web design organisation was most apparent within the Services/Transport (51%) and Wholesaler (50%) sectors. In summary, it can be seen that the micro-sized SME classifications placed a great emphasis on a "do-it-yourself" policy with regard to website development due to their financial restrictions and, possibly, a lack of awareness of organisational benefits that could be attained through significant investment in E-Business.

The exception to this proved to be the Communications/Computing sector, where typically a high level of in-house expertise existed to develop a website and utilise the IT/IS function effectively and a higher level of technological understanding. This was less prevalent in other industry sectors, where the expertise might be limited and an inferior and deficient website might result, which would negatively impact the enterprise. Larger-sized SME classifications were typically able to employ professional web design bodies to develop their website presence although there remained significant reliance on in-house personnel to undertake this function.

Website usage

The prime uses of the enterprise website were identified as to advertise and market products and services (29%) and generate enquiries (23%). More advanced website functions such as distributing information to suppliers (seven per cent), to employees (three per cent) and to generate sales (five per cent), were less significant. As before, these factors were more prevalent within the "10-49" and "50-249" SME sized classifications in contrast to the micro-sized groupings (Table 28). Thus, in summary, the predominant uses of the Internet were communication

and information collation related, with less prevalence given to online trading.

Table 28: Enterprise Usage for Organisational Websites by SME Size as a Percentage

			Percentage by Enterprise Size			
Factor	f	All %	SP %	1-9 %	10-49 %	50-249 %
Website use for advertising and marketing to customers	144	28.8	14.1	28.4	37.5	83.3
Website use for distributing information to suppliers	34	6.8	2.4	7.7	8.3	19.4
Website use for distributing information to employees	15	3.0	1.2	2.3	2.8	16.7
Website use for generating enquiries	113	22.6	12.4	22.1	31.9	55.6
Website use for online sales	25	28.8	2.4	5.4	5.6	13.9
Total Respondents	n=500	100%				

In terms of website usage by IA (Table 29) for advertising and marketing purposes the Communications/Computing industry (77%) identified the highest levels of deployment whilst the Retail/Repair (12%) the lowest. Website usage for distributing information to suppliers was highest in the Communications/Computing (29%) industry but minimal in the Construction (two per cent) industry. Website use for distributing information to employees was highest in the Communications/Computing (24%) but negligible in the Wholesaler, Retail/Repair and Agriculture/Forestry/Fishing sectors. Utilising a website to generate enquiries was particularly prevalent within the Communications/Computing (59%) but least significant within the Retail/Repair (10%) and Wholesaler (11%) industries.

Using the website for online sales was most significant within the Communications/Computing (18%) but least apparent within the Finance/Insurance/Real Estate/Legal or Agriculture/Forestry/Fishing sectors. As with the Internet usage, the Communications/Computing sector demonstrated the highest level of performance in each of the five

facets examined. The older more traditional industries such as Agriculture/Forestry/Fishing, Retail/Repair and Construction reported the lowest levels of deployment.

When website usage was analysed by LA, a number of trends emerged. No website usage was apparent in the Torfaen LA. Website usage for advertising and marketing to customers was most significant in the NPT local authority but least significant within RCT (18%) and Pembrokeshire (19%). Website usage for distributing information to suppliers was most significant in the NPT (11%) and Swansea (10%) but no usage for this function was identified in Pembrokeshire. In terms of website use for distributing information to employees was highest in Carmarthenshire (8%) but not apparent in Ceredigion, Pembrokeshire, RCT and MT. Website usage for generating enquiries was highest in NPT 33% and Swansea 31% but least significant in Ceredigion 13%. Website usage for online sales was highest in Carmarthenshire 14% but no usage was apparent in Ceredigion, Pembrokeshire and VG.

5.1.5 Impact of E-Business

Survey respondents were asked to identify the cost of their website development. Of the 165 enterprises with a website, 155 (94%) responded (Table 30). Of those enterprises that possessed a website, 78% identified paying money for its development, although this only represented 24% of the total survey population. For those enterprises, which identified paying for a website, 24% noted paying up to £100, whilst 25% reported paying up to £500 for their website development. Twenty one per cent of enterprises' Owner/Managers were unable to identify the cost of their website development.

This inability to identify implementation costs indicated a high level of ignorance suggesting a lack of strategic management, consideration and control of this function. Fifteen per cent of respondents identified paying more than £1,500 for a website development. The large sized SME classifications were prepared to pay higher amounts for a website

development, with 33% of the "50-249"sector paying over £2,000 for the cost of their website development.

Table 29: Enterprise Usage for Organisational Websites by IA as a Percentage

		Percentage by Enterprise Size										
Factor	f	All	Agriculture/Forestry/Fishing	Construction	Manufacturing	Communications/Computing	Wholesaler	Retail/Repair	Finance/Insurance	Services/Transport	Education	Other
Website use for advertising and marketing to customers	144	28.8	18.2	18.0	34.5	76.5	21.4	11.9	31.6	28.7	75.0	53.8
Website use for distributing information to suppliers	34	6.8	9.1	2.0	10.0	29.4	3.6	3.6	5.3	6.2	25.0	3.8
Website use for distributing information to employees	15	3.0	0.0	2.0	0.9	23.5	0.0	0.0	5.3	3.9	25.0	3.8
Website use for generating enquiries	113	22.6	18.2	12.0	29.1	58.8	10.7	9.5	23.7	23.3	75.0	38.5
Website use for online sales	25	28.8	0.0	2.0	9.1	17.6	3.6	4.8	0.0	2.3	25.0	7.7
Total Respondents	n= 500	100%										

Analysis by IA revealed little of significance; the Finance/Insurance/Real Estate/Legal (46%), and Construction industries (36%) spent the least amount on their website development (up to £100). Only the Manufacturing sector demonstrated any significant spending on the cost of their website development with 13% paying over £5,000. A number of sectors Owner/Managers were guilty of a lack of awareness regarding the cost of their web presence, including the Wholesaler (33%), Communications/Computing (31%) and Retail/Repair (27%) sectors.

When analysed by LA, SMEs in Cardiff 73%, VG 56%, NPT 44% and Swansea 39% were prepared to identify their level of investment in their website. The highest level of website investment was identified in Swansea (35%) and the VG (20%) with over £2000 being spent. Unfortunately, a high level of ignorance was evident towards website investment in Caerphilly (40%), Carmarthenshire (31%), Cardiff (25%), and Newport (25%) where the Owner/Managers were unable to identify the level of website investment.

Table 30: Website Cost to Development by SME Size Classification as a Percentage

	Percentage by Enterprise Size				
Cost	All SMEs %	SP %	1-9 %	10-49 %	50-249 %
£0 - £100	23.8	44.0	24.6	9.1	6.5
£101 - £500	24.5	32.0	31.9	5.2	12.9
£501 - £1,000	11.6	8.0	11.6	5.2	12.9
£1,001 - £2,000	3.9	0.0	4.3	3.9	0.0
£2,001 - £5,000	7.1	0.0	4.3	6.5	9.7
£5,000+	7.7	0.0	4.3	2.6	22.6
Don't Know	21.3	16.0	18.8	6.5	35.5

When asked to identify level of website income in the previous 12 months, 94% (n=153) of enterprises with a website chose to respond, representing 31% of the total survey population. Income was identified as orders taken directly from the website or orders arising from viewing of the website. This income was considered as additional to existing organisational earnings, as opposed to an alternative method of trading with existing customers. Of those that responded, 22% identified that they had not made any money from their website and 48% did not know the level of income attained. These results must be treated with caution as they represented a self assessment by the Owner/Manager and were potentially overly optimistic lacking empirical underpinning. These statistics suggested a high level of ignorance from the Owner/Managers perspective. Only 15% of website owners identified making in excess of £1,000 from their website in the last year.

In terms of SME size classification, the survey population that responded represented 14% of "Sole-Proprietor", 31% of "1-9", 42% of "10-49" and 83% of the "50-249" classification. An extrapolation of performance in each SME size classification was informative (Table 31). The "Sole-Proprietor" classification had a high proportion of enterprises that had not generated any revenue from their websites (25%) in the previous 12 months. Moreover, 42% of "Sole-Proprietor" SMEs sized Owner/Managers identified that they were unaware did not know how much revenue their website had generated. Encouragingly, 16% of Owner/Managers from "Sole-Proprietor" classified enterprises were able to identify that their website had generated in excess of £1,000 and eight per cent over £5,000 of revenue, which compared favourably with the larger-sized SME classifications. This evidence suggested that there were examples of pockets of good practice of E-Commerce and high exploitation within this particular SME size classification.

Table 31: Website Income Attained in previous Twelve months by SME Size classification as a Percentage

Revenue	SP	1-9	10-49	50-249
No Revenue	25.0	27.5	16.7	10.2
Don't Know	41.7	39.1	53.3	61.0
Over £1,000	16.3	8.0	23.0	15.7
Over £5,000	8.0	6.9	2.8	13.0

In terms of IA, a number of sectors identified no website income, including Construction (27%), Manufacturing (20%), and Services/Transport (24%). In addition, a high proportion of several IA sectors were unable to identify their level of website income, including Construction (55%), Manufacturing (45%), Wholesaler (84%), Communications/Computing (69%) and Services/Transport (43%). Only the Manufacturing sector was able to identify any significant level of income generation, with 15% of enterprises attaining in excess of £5,000. A chi-square test revealed an association between SME size classification

and generating sales (χ^2 = 8.906, p= 0.43 Appendix H – Table Four) from organisation use of the Internet, which suggested that larger SMEs were more effective in achieving sales turnover in contrast to micro-sized classifications.

When analysed by LA, NPT (25%) and Cardiff (22%) identified no website income. Furthermore, a large proportion of SMEs within LAs were unable to identify the level of income attained including Cardiff (57%), Swansea (52%) and Newport 48%. Only Carmarthenshire (19%) and NPT (19%) were able to identify a significant level of income generation with sales in excess of £5000. Enterprise size does not seem to provide any advantage in terms of greater awareness of E-Business performance. Both the "10-49" and "50-249" categories identified an excessively high 'Don't know' response, which suggested a lack of planning and evaluation of the E-Business function (Table 31). As would be expected, given the higher financial and personnel resources, the "50-249" sector recording the highest level of income attainment.

Best performance in IA was noted within 25% of Manufacturing enterprises achieved over £1,000, whilst 18% of the Retail/Repair sector achieved over £5,000 of sales in the previous 12 months. The Construction and Agriculture/Forestry/Fishing sectors proved to be the worst performing IA sectors with no enterprises achieving income over £1,000. When the SME Owner/Managers were asked to identify the location of their E-Commerce trade, this elicited a limited response from 71 respondents, which probably related to their lack of understanding, high level of ignorance and evaluation of their E-Commerce market. The fact that 79 respondents indicated that they were unaware of where their E-Commerce sales occurred supported this fact.

Significantly, overall results still indicated reluctance to trade outside Wales. Thirty-seven per cent of respondents indicated they did not trade within the UK outside Wales, 73% did not utilize EC trade and 74% global trade. By contrast, 49% of respondents indicated that they thought over 40% of their E-Commerce trade was within local trading markets in

Wales. Further analysis of averages supported this, with the Welsh market achieving an average of 43% and thereafter significantly less reliance on the UK (28%), EC (9%) and global trade (11%). These groupings reported significant variances within standard deviations (20% plus), suggesting wide extremes of practice. A three-way cross-tabulation of SME size classification against website cost and income revealed minimal data of significance.

It was apparent that website investment of over £5,000 only created an income in excess of £5,000 in three instances (two "50-249" and one "1-9"). A website investment of up to £100 generated an income of over £5,000 for six enterprises (two "Sole-Proprietor", two "1-9", one "10-49" and one "50-249"), thus providing limited evidence of the potential of E-Commerce to enhance revenue. These findings reflected the high levels of ignorance, limited understanding, evaluation and ambition towards adoption of E-Commerce trade within SMEs existing business practices. Survey respondents were asked to identify key drivers for adopting E-Business, barriers that inhibited this process and perceived future and current benefits attained from exploitation. It was vital that the public and private sector appreciated the opportunity that E-Business offered as these knowledge levels represented the basis for exploitation, which were considered within the following section.

5.1.6 Drivers/Barriers and benefits of E-Business usage

The literature confirmed that a lack of understanding or unrealistic perceptions could have a potentially detrimental influence on the usage and adoption process of E-Business. Enterprises connected to the Internet were asked to identify their drivers for adopting E-Business. This question was answered by 156 respondents, which represented 31% of the survey population.

Nine prime drivers were identified (Table 32), with the most significant being: -

Table 32: Drivers of E-Business Measured by SME Classification as a Percentage

	Total		Percentage by Enterprise Size			
Factor and Ranking	f	%	SP %	1-9 %	10-49 %	50-249 %
Create a new marketing media	99	63.5	11.5	27.6	13.5	10.9
Improve communication of information	99	63.5	7.1	26.3	14.1	16
Access new markets	92	59.0	12.2	23.7	12.2	10.9
Keep up with competitors	79	56.0	15.0	9.0	22.4	9.6
Customers demanding connection to enterprise services	69	44.3	5.8	15.4	10.3	12.8
Communications cost savings	66	42.3	5.8	17.9	9.0	9.6
Gain competitive advantage	64	40.9	6.4	14.7	8.3	11.5
Gain an innovative image	62	39.8	8.3	13.5	9.0	9.0
Suppliers demanding connection	30	20.2	3.0	3.8	8.3	5.1
Employees pushing for IT to support work	7	5.2	2.0	0.6	1.3	1.3
Other Drivers	5	3.2	0.0	1.3	1.9	0.0

- the opportunity to access a new marketing medium (63%)
- improve the communication of information with customers and suppliers and employees (63%)
- gain access to new markets (59%)
- keep up with competitors (51%)
- the importance of meeting customers' needs in improving connection to organisation services (44%)
- cost savings in communication (42%)
- to gain a competitive advantage (41%).

No significant trends emerged when drivers were evaluated by enterprise size classification, except the "1-9" grouping provided the most respondents, which could emphasise their desire for E-Business usage. The "Sole-Proprietor" size classification ranked accessing new markets as their most significant driver, in contrast to the "10-49" and "50-249" sectors, which placed greatest emphasis on improving the communication of information. Utilising a chi-square test to assess the relationship between SME size classification and driver variables, a positive association was identified (χ^2 =9.672, p=0.021 Appendix H - Table Five). In addition, a similar association was apparent between SME size classification and the desire to improve the communication of information (χ^2 = 10.014, p=0.016 Appendix H - Table Six).

The drivers to E-Business were evaluated as a percentage of total respondents in each LA within each facet examined. By ranking the drivers, it was apparent that SMEs in Newport were the most motivated to adopt E-Business, with 11 top rankings out of 11 factors examined in comparison with other LAs. The most significant drivers throughout all LAs proved to be the communication of information (17.7%) and marketing media (17.5%). The least motivated LA in terms of adopting E-Business proved to be Pembrokeshire, with an average ranking of nine point three, in comparison to other authorities. In terms of individual significance of each driver within LAs as a percentage of total respondents, the desire to gain access to next markets (38.9% in NPT) was the most significant driver whilst the employers pushing IT within the enterprise was the least significant (5.9% in Bridgend).

When the drivers to E-Business were analysed by IA, a number of trends were apparent. The Communications/Computing industry (35.9% average) proved to be the most prevalent in terms of consideration of drivers to E-Business with five top rankings in areas such as communication cost savings, customers and suppliers demanding

connection, new marketing media and creating a new competitive advantage. The least motivated IA in terms of consideration of E-Business adoption proved to be the Retail/Repair industry (5.4%) which achieved an average ranking of nine in the 11 facets.

Overall the most significant drivers by IA proved to be: -

- Improve the communication of information (16.2%)
- Utilise a New Marketing Medium (16.2%)
- Gain access to new markets (15.1%).

In summary, the prime drivers for E-Business remained pragmatic and driven by the knowledge and understanding of the Owner/Manager. The SME Owner/Managers perceived E-Business as an agent of change that could potentially increase turnover, enhance prime business functions such as marketing and improve the efficiency of the business operation. Therefore, there was an appreciation of potential usage of deployment although the understanding of how this could be achieved remained questionable.

5.1.7 Inhibitors to adopting E-Business

Seventy-three per cent of all survey respondents responded to this question. Overall, the most significant inhibitors to the adoption of E-Business (Table 33) were perceived as: -

- time to develop and maintain E-Business operation (29.4%)
- lack of IT/IS skills (28.8%)
- low use by customers and suppliers (16.5%)
- insufficient financial resources (21.8%)
- to a lack of information, advice and support (21.2%)
- lack of understanding, confidence and awareness (20%)
- not relevance to organisation (20%)

- security concerns (10%).

When analysed by SME size classification, variation between results was minimal, although the frequency of the inhibitors was more prevalent within the "10-49" (26.7% average) and "1-9" (22.4%) sectors in comparison to the other SME size classifications (Table 33). Within the "Sole-Proprietor" sized enterprises the most prevalent inhibitors were identified as time to develop and maintain an E-Business operation (45.5%), fear of domination by a large business (45.5%) and a lack of IT skills (36%).

Table 33: Perceived Inhibitors to Adopting E-Business by Percentage

		Percentage by Enterprise Size				
Factor	f	All %	SP %	1-9 %	10-49 %	50-249 %
Time to develop and maintain E-Business operation	202	29.4	45.5	50.0	41.7	29.4
Lack of IT/IS skills	170	28.8	36.0	44.4	25.0	28.8
Low use by customers and suppliers	129	16.5	29.7	38.9	19.4	16.5
Insufficient financial resources	128	21.8	28.4	27.8	22.2	21.8
Lack of information, advice and support	106	21.2	21.2	26.4	11.1	21.2
Lack of understanding, confidence and awareness	106	20.0	22.5	26.4	8.3	20.0
Not relevant to my organisation	105	20.0	21.6	23.6	16.7	20.0
Concerns over security	62	10.0	12.2	16.7	16.7	10.0
Organisation structure and culture	27	2.4	3.2	11.1	22.2	2.4
Other issues	14	2.4	4.1	1.4	0.0	2.4
Fear of domination by large business	6	29.4	45.5	50.0	41.7	29.4

The most significant inhibitors in the "1-9", "10-49" and "50-249" SME size classifications were identified as fear of domination by a large business and time to develop and maintain an E-Business operation. A

chi-square test was used to assess the significance of the association between variables. A positive association was identified (χ^2 =10.014, p=0.016 Appendix H - Table Seven) between the business inhibitor lack of information, advice and support and SME size classification. This suggested that SME Owner/Managers understood the nature of E-Business, but were inhibited from increasing their E-Business sophistication due to organisational limitations in resources.

In terms of IA, the most prevalent inhibitors were identified as time to develop and maintain E-Business website (40.4%) and lack of IT skills (34%). Barriers to E-Business were most prevalent within the Wholesaler sector which achieved the highest average ranking (two point three) followed by Agriculture/Forestry/Fishing (three point nine). Inhibitors were less prevalent within Health/Medical (nine point four), Retail/Repair (seven point nine) and Communications/Computing (Seven point one). The most significant inhibitors in terms of individual industries were as follows. Time to develop and maintain a website was identified as significant within the Finance/Insurance/Real Estate/Legal (63.2%), Other (61.5%) and Wholesaler (60.7%) industries. Lack of IT skills was most prevalent within the Agriculture/Forestry/Fishing industry (63.6%). Understanding confidence and awareness was identified as a significant issue within the Agriculture/Forestry/Fishing (54.5%) industry.

When analysed by LA, a number of key trends were apparent. Torfaen (36.1%), Newport (26.7%) and Caerphilly (26.6%) were most influenced by the impact of inhibitors on their E-Business operation. BG, (12%), Ceredigion (14.7%) and the VG (16%) identified the least impact on their business operation from E-Business inhibitors. In terms of IA, the time to develop and maintain an E-Business website (40.3%) and lack of IT specialist skills 33.5% were the most prevalent inhibitors to E-Business usage.

In summary, SMEs Owner/Managers perceptions regarding the most significant inhibitors to their E-Business operations' were typically related to organisational resources, such as personnel and finance and the ability to implement and maintain the E-Business operation effectively. Less significance was awarded to increased information on and understanding of E-Business.

5.1.8 Perceptions of E-Business

Survey respondents were asked to identify current and future benefits that were attainable from an E-Business operation (Figure 25). The key immediate benefits were identified as: -

- new methods of advertising products and services (40%)
- improved access to information (35%)
- reduced cost of communication with customers (32%).

Key future benefits were identified as: -

- new methods of marketing and advertising (47%),
- reduced cost of communication with customers (39%)
- increased revenue (35%).

Greater prevalence was awarded to increased revenue in future attainable benefits suggesting that this ideal had not been currently achieved. This supported the findings of the earlier section, which identified that only a small proportion of SMEs reported making a profit from their E-Business operation. Thus, attaining a profit from E-Business was still perceived as a future ideal. When the Owner/Managers perceptions of business benefit from E-Business by SME size classification in terms of current and future relevance, were analysed some trends were apparent.

The "Sole-Proprietor" grouping ranked the current key benefits as advertising and marketing (27%), reduced cost of communication with

customers (27%) and new markets (27%), with equal precedence. There were minimal changes in the future, with almost equal significance being awarded to new methods of advertising and marketing (28%, plus one per cent) and reduced cost of communication with customers (26%, minus one per cent). In the future, more emphasis was awarded to the benefits of reducing costs with suppliers (25%) than accessing new markets. In terms of current benefits, the "1-9" sector was more concerned with increased revenue (63%), accessing new markets (50%) and reducing administrative costs (48%).

In the future, aspirations were similar, although there was less conviction in the ability to attain higher revenue (50%, -13%) and the ability to exploit new markets (49%, minus one per cent). Greater future significance was awarded to increased access to information (49%) and improved suppliers and customer links (49%). The "10-49" sized sector identified the most significant immediate benefits as reduced cost of communications with suppliers (24%) and customers (23%) and improved access to information (21%).

In terms of future benefits, reduced costs of suppliers' communication (23%, minus one per cent) were ranked as most significant, alongside new organisational forms (23%) and the development of business partnership through strategic alliances and outsourcing (22%). Within the "50-249" sized sector, current perceived benefits were seen as the creation of strategic alliances (33%) and reduced administrative costs and increased efficiency (23%). There were minimal changes in terms of future perceived benefits (Figure 25) with highest priority awarded to strategic alliances (20%, -13%) and reduced administrative costs (16%, minus seven per cent). However, more significance was awarded to the benefits attainable from new organisational forms (16%) in the future.

When perceived benefits were analysed by IA the most prevalent by response across all categories were Manufacturing, Services/Transport, Retail/Repair and Finance/Insurance/Real Estate/Legal. The

Manufacturing sector identified the most significant perceived current benefits as the new methods of advertising and marketing its products and services (17.4%). The future benefits were identified as potentially increased revenue (13.8%), access to new markets (14%) and the new methods of advertising and marketing (17.4%). Within the Finance/Insurance/Real Estate/Legal sector the most significant perceived current benefits was the reduced cost of communication with customers (5.8%) and improved access to information sources and information exchange (6.3%). The significant future benefits were identified as reduced cost of communication with customers (6.9%) and new methods of advertising and marketing (5.5%). The Services/Transport industry identified its most significant current benefits as new methods of advertising and marketing (16.8%) and improved access to information sources and information exchange (11.6%).

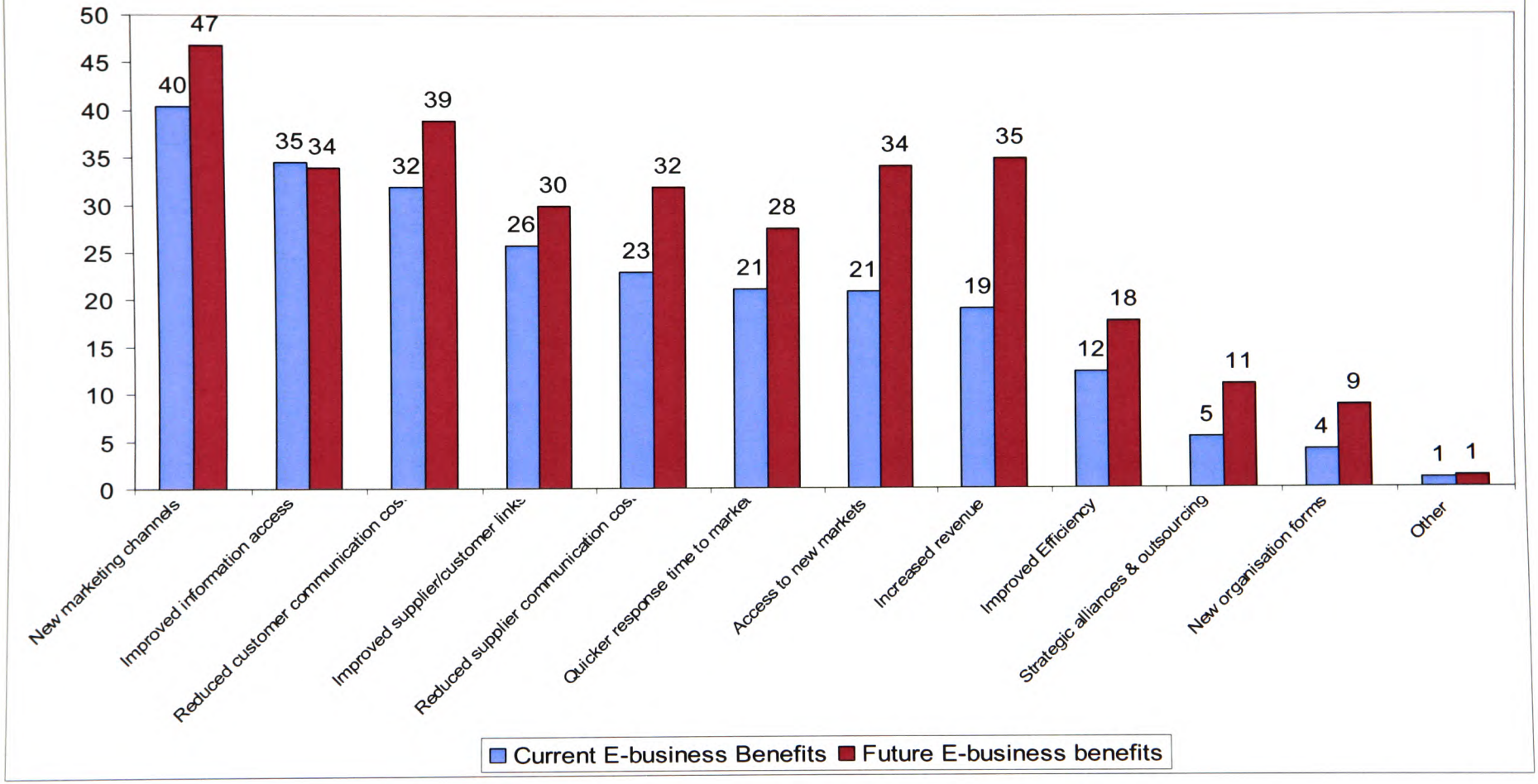
Similarly, future perceived benefits were noted as new methods of advertising and marketing (16.8%), improved access to information sources and information exchange (11.3%) and reduced cost of communication with customers (12.9%). The Retail/Repair IA identified current perceived benefits as improved access to information sources and information exchange (five per cent) and new methods of advertising and marketing (6.1%). Significant future perceived benefits were identified as new methods of advertising and marketing (7.4%) and increased or improved supplier/customer links (7.4%). When the variances between current and future benefits were analysed the most significant positive swings where: -

- increased revenue in the Manufacturing industry (plus 6.3%)
- increased and new access to national and global markets in the Manufacturing industry (plus five per cent)
- reduced cost of communication with suppliers in the Manufacturing industry (plus 3.3%).

The most significant negative swing was witnessed within: -

- improved access to information sources and information exchange in the Finance/Insurance/Real Estate/Legal (minus 1.9%)
- increased improved supplier/customer links in the Manufacturing industry (minus 1.7%) .

Figure 25: Perceived benefits of E-Business - current and future perceptions as a percentage



When analysed by LA Cardiff, Swansea, Carmarthenshire and Newport were the most prominent respondents. Cardiff identified improved access to information sources and information exchange (7.7%) and reduced cost of communication with customers (6.1%) as the most significant current perceptions. Future benefits were identified as new methods of advertising and marketing products and services (9.4%), reduced cost of communication with customers (7.7%) and improved access to information sources and information exchange (6.9%). In Swansea, the most significant current benefits were described as new methods of advertising and marketing products and services (6.9%, and improved access to information sources and information exchange (five per cent). Key future benefits were identified as new methods of advertising and marketing products and services (7.7%), reduced cost of communication with customers (5.8%) and increased revenue (5.8%).

In Carmarthenshire, current benefits were identified as new methods of advertising and marketing products and services (5,2%). Whilst future benefits were identified as new methods of advertising and marketing products and services (7.2%) and increased revenue (5.8%). Newport's most prominent perception of E-Business benefit was identified as new methods of advertising and marketing products and services (5.8%). The most positive significant swing between current and future perceptions was evident in Newport with a quicker response time to market and shortening supply chain (8.8%). There was a minor negative swing in the improved access to information sources and information exchange (1.1%) factor.

In terms of associations between variables, a chi-square test revealed an association between SME size classification, achieving a future quicker response time to market and shortening the supply chain (χ^2 = 8.345, p=0.040 Appendix H - Table Eight). In addition, an association was confirmed between SME size classification and the desire to currently and in the future benefit from reduced internal administration costs and increased efficiency (χ^2 = 20.230, p<0.001 and χ^2 =12.949, p=0.004

Appendix H - Table Nine and 10). Further chi-square associations were recorded between SME size classification and the current desire to increase revenue (χ^2 = 16.393, p=0.001 Appendix H - Table 11). An association was identified between SME size classification and the desire to benefit from strategic alliances and outsourcing in the future (χ^2 = 10.676, p=0.024 Appendix H - Table 12). Whether these aspirations were actually being realised was debatable and further investigated within Chapter Six.

In summary, this analysis revealed that SME Owner/Managers were both aspirational and realistic in their perceptions of E-Business benefits. Current E-Business benefits perceived included focus on increased efficiency, improved communication and entering and exploiting new business markets. There was less consideration of E-Business as an agent of change capable of achieving a significant organisational transformation or encouraging business partnerships. This suggested that change was required in Owner/Manager strategic thinking within the management of the SME to successfully embrace E-Business. The contrast between future and current E-Business benefit was minimal, although the larger-sized SME classifications paid more regard to the benefits attained from organisational transformation.

5.1.9 Problems with E-Business

Four significant current problems associated with E-Business were identified by Owner/Managers. The most prevalent was identified as IT/IS expertise (40%), security issues associated with E-Commerce transactions (36%) and the cost of telecommunication services (33%). Contrastingly 20% of respondents identified that there were no perceived current problems with E-Business. All the future E-Business problems were deemed less significant by respondents and there was increased confidence in no perceived problems (24%). Three predominant future problems were acknowledged as security problems associated with E-Commerce transactions (29%, minus four per cent), a lack of IT expertise

(29%, -11%) and cost of telecommunication services (20%, -13%). There remained ongoing concern towards E-Commerce security, regarding the capabilities of technology to overcome mistrust of customers and providers. Further concerns regarding ongoing cost of telecommunications and the necessity for trained IT/IS staff were an obvious and fundamental business issue, with respect to effective allocation of the appropriate resource to fulfil a business need. In terms of issues with individual SME sized classifications, the perception of problems associated with E-Business was less significant in the future than currently, with most confidence demonstrated within the "10-49" sized sector.

The "Sole-Proprietor" micro-sized classification placed most current and future significance on problems of bandwidth (29% and 34%). Similarly, the "0-9" micro-sized classification gave most prevalence to technological infrastructure issues, both currently (bandwidth 55%, telecommunications cost 48%) and in the future (technological standards 48%, telecommunications cost 47%). This trend continued within the "10-49" grouping with most significance awarded to technological standard currently (37%) and in the future (26%). By contrast, the "49-249" SME sized classification had increased confidence with both current and future scenarios, giving most precedence to no perceived problems.

When analysed by IA, the identification of perceptional barriers to E-Business was more apparent within the Manufacturing and Services/Transport sectors. Within the Manufacturing industry the prevalent current problems were perceived as issues with E-Commerce (6.6%) and getting sufficient IT expertise (6.7%). The most significant future problems were identified as associated with E-Commerce transactions (6.1%) and providing sufficient IT expertise (5.8%). By contrast, the manufacturing industry also noted that there were no current (eight per cent) or future perceived problems (5.8%) with an E-Business operation. The Services/Transport sector identified current issues with

E-Commerce transactions (6.3%) and problems of getting sufficient IT expertise (7.2%). These same factors were apparent when Owner/Managers considered their future potential problems with an E-Business operational, although they were considered a declining threat (E-Commerce transactions 6.1% and IT expertise 6.1%). As in the Manufacturing industry the Services/Transport industry suggested that there were no relevant current (4.7%) or future threats (4.1%) to an ongoing E-Business operation. There were no significant negative swings between current and future perceived E-Business problems although there was a positive drop (plus three per cent) in the threat offered by the costs of E-Business telecommunications services in the Manufacturing industry. The belief that E-Business offered no perceived problem declined (minus 2.2%) in Manufacturing SMEs suggesting that such Owner/Managers lacked future confidence in their E-Business operation.

When analysed by LA, the acknowledgment of the existence of barriers to E-Business by the SME Owner/Manager was prominent in Cardiff, Swansea and Newport. In Cardiff, the most significant perceived problems were all current issues namely E-Commerce transactions (4.4%), costs of telecommunications services (4.4%) and problems of getting sufficient IT expertise (3.9%). In Swansea, the current issues concerned problems associated with E-Commerce (3.3%) and the costs of telecommunications service (3.3%). Similarly the key future problem with E-Business was seen as the issues associated with E-Commerce transactions (3.3%). Newport identified the key current issues as the problems associated with E-Commerce transactions (3.3%) and issues related to IT expertise (three per cent). In summary, the micro-sized SME classifications ("Sole-Proprietor" and "1-9") remained concerned regarding immediate issues such as access cost. Overall the key perceived problems remained as limited IT/IS expertise, on going costs and security concerns.

5.1.10 Planning the E-Business process

A number of questions were designed to establish the level of planning undertaken within the SME sector. Questions 2c and 2d (Appendix B) were designed to establish the level of staffing allocated to manage the E-Business function, whilst questions 4b and 4c were included to evaluate business planning and organisational impact. In total 72% of the survey population responded to this question. Respondents were asked to identify the number of people responsible for the IT/IS function: 55% identified one person, 26% between two and 10 people and 18% found that no one was appointed to undertake this function. When viewed by enterprise size classification, it was apparent that within the "Sole-Proprietor" category, control was the sole responsibility of the Owner/Manager (84%) although 16% of "Sole-Proprietor" allocated no responsibility for this function.

This trend continued in the larger-sized SME groupings, with a significant proportion providing no management of the IT/IS function ("1-9", 17%, "10-49", 21% and "50-249", 26%). Even within the larger-sized SME classifications ("1-9", 51%, "10-49", 46% and "50-249", 12%) results suggested that there was a minimal management function of the IT/IS function with only one person with responsibility. In terms of the number of people responsible for the IT/IS function when analysed by LAs, Torfaen (84.6%), Carmarthenshire (67.6%) and RCT (67.6%) identified the highest level of SMEs with one person taking responsibility. Between two and 10 people taking responsibility for the IT/IS function was most prevalent within the Pembrokeshire (47%) and Newport (42%). LAs which did not allocate anybody for responsibility for the IT/IS function included BG (36%), Ceredigion (26.7%), Swansea (22%) and Bridgend (22%).

When contrasted by IA, the Agriculture/Forestry/Fishing sector was most susceptible of neglecting the IT/IS function, with 44% of such enterprises having no one responsible for its management. The norm was for one

person to undertake responsibility within the enterprise (Retail/Repair 67%, Wholesaler 60%, Construction 55%, Manufacturing 55%, Agriculture/Forestry/Fishing 33% and Communications/Computing 29%). In certain IA sectors, less staff were allocated to support and manage the IT/IS function, although, as might be expected, 59% of all Communications/Computing enterprises allocated between two and 10 employees, in comparison to 32% of Wholesaler and 26% of Retail/Repair classified enterprises. Surprisingly, no enterprise reported to subcontracting the IT/IS function. This evidence suggested that the human resource managing or responsible for the IT/IS function was under-resourced within the SME sector in Wales.

When asked whether E-Business had been integrated within the overall business planning processes of the business, 156 responded, which represented 31% of the total survey population. Of these, 46% responded positively, 36% negatively and 17% did not know. When contrasted by SME size classification, some variation was apparent, with usage varying from 40% within the "Sole-Proprietor" and "10-49" sectors to 44.3% within the "1-9" sector and 58.1% in the "50-249" sector. This evidence suggested that enterprise size was a factor when determining the integration of E-Business within the business planning process with more prevalence apparent in the largest sized SME classified enterprises.

Levels of E-Business integration with other planning processes was less significant within the "Sole-Proprietor", "1-9" and "10-49" SME micro-size classifications were deployment were fairly consistent. As might be expected, 75% of the SMEs within the Communications/Computing sector identified that E-Business was integrated within their business planning. However, this was the exception, with the Manufacturing (48%), Retail/Repair (36%), Wholesaler (33%), Finance/Insurance/Real Estate/Legal (31%) and Construction (18%) sectors undertaking significantly less planning. Thus, the evidence suggested that the strategic planning of the E-Business function was more prevalent within industries, which were more reliant on technology within their core

operations and less significant within more traditional primary sector classified enterprises (Poon, 2000).

In summary, the evidence suggested a lack of strategic planning within the SME sector as a whole and particularly within the micro-sized classifications and more traditional industries (Alpkan et al, 2007). Indeed when analysed by LA classification where (n>10) Swansea (69.6%) and NPT (50%) identified the highest levels of integration of E-Business planning with overall business planning. Low levels of E-Business planning integration were prevalent where the Owner/Managers responded negatively, provided no response or did not know. This was particularly prevalent within Carmarthenshire (68.8%), Cardiff (58.3%) and Newport (57.1%) LAs.

5.2 Conclusion

This chapter presented a study of E-Business usage by SMEs in Wales contrasted by SME size classification, IA and LA. As identified within Section 2.2, the survey provided an approximation of the Welsh SME population with an adequate representation of the micro-sized classification in comparison to the national comparators. The study recognised that there was an under-representation of the "Sole-Proprietor" sector within respondents, although this was compensated by the overall number of survey respondents within the combined '0-49' groupings (SBS, 2003). This was due to a number of factors, including the transient nature of such micro-sized enterprises, with high failure rates, and the resultant difficulty of obtaining reliable contact data from this client group (Levenburg, 2005; SBS, 2005b). Furthermore, notable resistance was experienced from "Sole-Proprietor" Owner/Managers to partake in such a study, despite reassurances, due to pressures of work and the perception of a lack of value and applicability in the process, also recognised by Poon (2000) and Levenburg (2005).

Overall, usage levels of E-Business were lower than the results reported within the prior studies presented within section 3.8, which was probably a reflection of the representative survey population with a large proportion of micro-sized SMEs. A review of existing trading markets revealed a high dependency on local markets within Wales, as reported within NOP (2000) and eCIC (2005), with minimal trade undertaken outside this area, especially within the micro-sized SME classifications. This suggested, SME Owner/Managers had limited growth aspirations and there was potential opportunity to expand within new markets outside Wales. The utilisation of E-Business offered the potential of trading expansion through E-Commerce and increased efficiency through IT/IS usage.

The evidence presented within this survey however, suggested that current E-Business uptake was extremely limited, especially of the more sophisticated levels of technologies. Predictably, throughout the survey, the larger-sized ("10-49" and "50-249") SME classifications reported higher uptake of technology than the micro-sized enterprises ("Sole-Proprietor" and "1-9"), a trend mirrored within eCIC (2005) and Fink and Disterer (2006). Uptake of basic IT/IS was disappointing with 29% of all respondents reporting no usage, with significantly higher levels of deployment reported within the larger-sized classifications ("10-49" and "50-249"). Analysis of usage by IA revealed high levels of uptake within the enterprise types more reliant on technology (Communications/Computing and Manufacturing), for core business operations with less uptake in the older, more traditional businesses, such as Construction and Agriculture/Forestry/Fishing, a trend mirrored in prior studies including Mitchell and Clark (1999). Analysis of usage of E-Business by LA revealed little in the way of significant trends. All these facets are summarised against the extant literature within Chapter Seven.

Utilisation of more sophisticated technologies, such as networks, was negligible, with the exception of the "50-249" SME size classification.

By contrast, daily levels of utilisation of IT/IS usage by enterprise staff was high, suggesting that SMEs were exploiting available technology as identified within eCIC (2005). Usage of the Internet within enterprises was disappointing, with only 57% reporting access to the Internet, which was significantly lower within the micro-SME sized classifications. E-mail, EDI and website usage followed the same trend, with higher utilisation within the larger-sized SME classifications.

In terms of website development, it was apparent that there was excessive reliance on in-house expertise, especially within the micro-sized classifications. Thus, it was apparent that there was limited IT/IS investment especially within the micro-sized ("Sole-Proprietor" and "1-9") SME classifications in contrast to larger-sized SME enterprises, a fact also recognised within eCIC (2005). This result suggested a lack of understanding and high level of ignorance regarding the opportunities that website ownership offered the micro-sized SME. This scenario was supported when the level of website investment was considered, with only 19% (n=29) investing over £2,000 and the average investment in the region of £101-£500. Subsequently, there was a lack of effective income attainment from website utilisation, with only 15% of users identified making in excess of £1,000 during the last year. There was, however, some limited evidence of effective website utilisation within the "Sole-Proprietor" sector, suggesting pockets of good practice. A significant proportion of all SMEs size classifications (21%) however, were unable to accurately identify levels of website income, which suggested a lack of management and planning of this E-Business and a high level of ignorance.

It was essential to understand the motivations of SME Owner/Managers regarding E-Business deployment, to assess their understanding, awareness and ambitions. As noted in Section 3.6 Lau and Voon (2004) suggested that successful E-Business adopters were motivated and entrepreneurial in nature with an ability to accept and manage risk. The prime motivations concerned improving organisational efficiency

through improved marketing and communication with external and internal groups. Thus, E-Business was regarded as a mechanism capable of improving trading performance and key business functions. It was apparent that key inhibitors existed to deter the usage of E-Business within SMEs the most prevalent being the time to develop and maintain an E-Business operation, insufficient IT/IS skills, low usage by customers and suppliers and limited financial resources. A lack of information, advice and support and limited confidence, understanding and awareness were considered less significant. This suggested that the level of E-Business awareness had improved and SME Owner/Managers were more concerned with day-to-day operational issues inhibiting IT/IS usage. Whilst evidence suggested awareness of E-Business had improved amongst SME Owner/Managers, it was questionable whether understanding of their effective deployment had improved significantly.

When questioned regarding perceived current and future benefits of E-Business, it was apparent that there was greater focus on immediate attainable benefits, such as improved advertising, access to information, increased revenue and improved communication. Significantly, less prevalence was given, both currently and in the future, to higher level E-Business opportunities, such as organisational transformation and increased business partnerships. This evidence suggested that a key issue with E-Business usage and adoption was that SME Owner/Managers lacked strategic focus towards IS/IT and awarded greater precedence to critical everyday operational processes and ongoing business sustainability. This trend continued with the recognition of problems associated with E-Business usage, with greater prevalence awarded to issues that influenced everyday operational procedures. The Owner/Manager's apparent focus on immediate operational matters within SMEs was a reflection of the insufficient planning processes that occurred within the sector. It was apparent that the IT/IS function was under-resourced in terms of human resource allocated, with minimal actual management undertaken and virtually zero strategic planning of E-Business (eCIC, 2005).

In conclusion, the findings of this chapter supported the framework (Figure 14) proposed in Section 3.10 and provided significant evidence towards the first and second research questions identified in section 3.11. The framework recognised that several drivers and inhibitors underpinned SME E-Business usage, a fact supported by the literature and the survey findings. This chapter verified the existence of E-Business inhibitors and the importance of perceptions that positively and negatively influenced the Owner/Manager. Poor levels of sophisticated E-Business usage were identified, specifically within the micro-sized SME classifications ("Sole-Proprietor" and "1-9"). A key reason for this was the lack of strategic planning and resource allocated to E-Business usage and there was a need to explore the reasons behind this phenomenon.

The quantitative studies, whilst providing a useful snapshot of E-Business, imparted no indication of the motivations and understanding of Owner/Managers within individual SMEs to clarify the issues regarding the dynamics of usage (Poon and Swatman, 1997b). This chapter highlighted the need to provide a qualitative context of SME Owner/Managers experiences to clarify understanding of E-Business usage in comparison to the larger size classifications. This survey revealed the "Sole-Proprietor" SME micro-sized classification as the worst performing grouping in all facets of E-Business uptake in comparison to the larger size classifications.

Sole-Proprietor sized SMEs have remained under researched especially within the context of E-Business (Craighead and Laforge, 2003). Therefore, there was a necessity for a qualitative study of individual SMEs E-Business usage within the "Sole-Proprietor" sector from the perspective of the Owner/Manager, to explore and critically evaluate the patterns of usage, which was provided within Chapter Six. Chapter Seven drew conclusions on the identified research questions utilising some of the key findings from this chapter.

Chapter 6:

Case Study Analysis of E-Business Adoption in "Sole-Proprietor" SMEs

Chapter 6: Case Study Analysis of E-Business Adoption in "Sole Proprietor" SMEs

Previously, Chapter Five provided a quantitative review of the SME sector within Wales identifying the key variables of E-Business usage. Chapter Six provided a focused analysis of E-Business usage within the "Sole-Proprietor" micro-sized SME sector. This chapter undertook a comparative longitudinal case study analysis within "Sole-Proprietor" sized classified SMEs, to investigate and understand the Owner/Managers' attitudes towards the exploitation of E-Business technologies, including investigating enterprise demographics, levels of IT/IS utilisation and key determinants and issues influencing usage.

The attitudes towards E-Business usage were assessed through Owner/Manager responses to each element of the semi-structured questionnaire. The variables under investigation, namely the organisation demographics, levels of E-Business deployment, drivers and inhibitors to usage and perceived benefits and problems connected to deployment, provided rich qualitative data towards the construction of a conceptualisation of the environment representing usage within the "Sole-Proprietor" SME community presented within Section 7.2.3. This chapter commenced with an overview of the enterprises included within this element of the study. The case studies were contrasted against the key issues identified within the conceptual framework within Chapter Three, Section 3.10. The key issues were:-

- overview of participants
- usage and impact of IT/IS
- usage and impact of E-Business
- drivers to E-Business
- barriers to E-Business
- website utilisation
- E-Business and its strategic management and planning
- conclusions on E-Business utilisation.

6.1 Overview of Participants

Case study participants were initially interviewed during 2004 and thereafter revisited between 2005 and 2006, a period spanning approximately 18 months to develop a longitudinal perspective regarding usage of E-Business upon the enterprise. An overview of the case study participants within this part of the study was provided within Table 34, whereby the SME size classified enterprises were selected from a range of industrial sectors from UAs throughout Wales. Enterprise activity varied from stuntman to sheep farming, ensuring E-Business usage from a range of business sectors and activities was explored, enabling the study to contrast and critique a diversity of practice and experience. The rationale for the selection of "Sole-Proprietor" sized enterprises was provided within Section 4.13.6. The identity of the participant enterprises and all individuals therein was protected by use of an anonymous coding system (e.g. letters A-J were used to differentiate each study) as elaborated within 4.17.

The business performance of the enterprises surveyed ranged enormously, with annual turnover from under £10,000 per annum to in excess of £250,000. At the time of submission of this thesis, two of the enterprises had undergone a significant growth expansion in terms of number of employees (G and H), one has undergone a transformation in terms of trading pattern (B), and D had ceased trading, reflecting the transient nature of the SME. In addition, one enterprise website had been temporally withdrawn (G) for redevelopment. An individual profile of each enterprise was included within Appendix D and an example of a transcript of a completed interview with enterprise A within Appendix E. The next section considered the level of technology deployment within the enterprises surveyed.

6.2 Usage and Impact of IT/IS

This section considered and contrasted the level of IT/IS deployment within the case histories. Table 35 provided a demographic profile of the level of IT/IS within each enterprise. Basic IT/IS was consistent, with all participants utilising one or more PCs running application software, typically Microsoft Office, although network usage was limited to half the respondents.

Table 35: Levels of IT/IS deployment

Case Study	One PC	More than one PC	Application Software	Network	Wide Area Network
A	✓		✓		
B		✓	✓	✓	
C	✓		✓		
D	✓		✓		
E		✓	✓	✓	
F		✓	✓	✓	
G		✓	✓	✓	
H	✓		✓		
I	✓		✓		
J		✓	✓	✓	

Typical application software utilisation included word processing for the production of basic administrative documentation, spreadsheets for financial planning and forecasting, accounting for sales and invoicing and database usage for inventory scheduling and control. Several respondents noted the use of desk top publishing (DTP) and web design software to encourage the promotion of the enterprise. Only one enterprise identified using specialist software to assist with a production process (E). Representative quotes regarding usage of IT/IS included: -

> *"IT is mainly used to support the business administratively." (case study A)*

> *"I use word processing to support the administrative activities, whilst my other software allows me to promote the activities of my enterprise." (B)*

"IT usage is minimal, it supports the paperwork side of the business." (I)

Table 34: Demographic Overview of Case Studies

Case Study	IA Classification	Enterprise Description	Enterprise Location by UA	Enterprise Size by Employee Number	Turnover Per Annum
A	Services/Transport	Guesthouse	Swansea	Sole-Proprietor	Under £50,000
B	Retail/Repair	Second-hand record store	Neath	Sole-Proprietor	Under £50,000
C	Services/Transport	Stuntman	RCT	Sole-Proprietor	No response
D	Manufacturing Retail/Repair	Manufacture and sale of jewellery	Blaenau Gwent	Sole-Proprietor	Under £10,000
E	Manufacturing Retail/Repair	Manufacture and sale of bespoke medals	Caerphilly	Sole-Proprietor	Under £50,000
F	Retail/Repair	Antique shop	Carmarthenshire	Sole-Proprietor	Over £100,000
G	Agriculture Retail/Repair	Egg production and Sale	Pembrokeshire	Originally Sole-Proprietor now 1-9	Between £200,000 and £250,000
H	Agriculture Retail/Repair	Sheep farming and sale	Carmarthenshire	Originally Sole-Proprietor now 1-9	Between 50,000 and £100,000
I	Services/Transport	Restaurant	Swansea	Sole-Proprietor	Over £200,000
J	Manufacturing Retail/Repair	Manufacture and sale of pottery	RCT	Sole-Proprietor	Over £150,000

However, by contrast: -

> *"IT/IS is critical to the long term success of the business." (J)*
>
> *"Yes, I consider IT as part of the total growth strategy of the business." (G)*
>
> *"IT/IS makes a major contribution in the organisation and running of the business." (E)*
>
> *"I recognise that technology can make a significant impact on the business. We use the word processing and spreadsheet software to improve business efficiency and streamline processes." (F)*
>
> *"The business is run entirely on the back of IT from establishing a customer database... to direct marketing." (H)*

Thus, it was apparent that even with basic IT/IS functionality, enterprises were divided as to the value of the operation with phrases such as "support" and "administrative" commonplace. The first set of quotations suggested that IT/IS was regarded only as a support or administrative function, which implied a limited and perhaps uninformed perspective regarding the benefit that usage could potentially provide. The second set of comments suggested a greater understanding and appreciation being attributed to the importance of IT/IS towards business competitiveness, with words such as "success", "contribution" and "impact" utilised.

The differences between these perceptions seemed to be strongly related to Owner/Manager understanding of IT/IS knowledge and its potential. Unquestionably, there were differing levels of IT/IS intensity dependant on the nature of the industry. For example, one would expect Communications/Computing enterprises to utilise more IT/IS than Agriculture/Forestry/Fishing related enterprises. Thus, the supportive comments suggested that SMEs, once they realised the administrative benefits in terms of reduced costs and increased efficiency, were prepared to explore and experiment with IT/IS to identify further potential gains. However, there remained a limited understanding and

appreciation and thus utilisation, regarding the opportunity that IT/IS offered.

When the enterprises were revisited, there was minimal apparent change in attitudes, although perhaps a grudging acceptance of contribution of IT/IS in most instances. Some typical comments included: -

> *"IT usage and the website remain important to my business and contributes to my ongoing success." (C)*

> *"I suppose IT does make more of a contribution than I first thought. It does help my business be more efficient and gives a more professional appearance to customers in terms of appearance of paperwork." (G)*

In terms of usage of technology, there were minimal changes of significance during the course of the study. One enterprise (E) had upgraded their software from Microsoft Works to Microsoft Office, the rationale being to benefit from the increased functionality of the more sophisticated software. The Owner/Managers of enterprises B and E identified making use of software that they had not previously utilised, namely DTP and spreadsheet software. The rationale for this was initially experimentation on the part of the Owner/Manager due to the availability and affordability of this software. The ease of use of the software meant that perceived business benefit could be attained from usage. The attitudes towards IT/IS seem to be connected with the level of evaluation and planning of the function undertaken. The perception of IT/IS as an administrative cost was generally considered within Owner/Managers of enterprises where there had been minimal or no attempt to evaluate the impact of the application software (A, G and I). However, in enterprises where E-Business was central to the business operation (B, E and J) there was consideration of the effectiveness and ongoing development of the software.

6.3 Usage and Impact E-Business

This section considered the usage of advanced E-Business, which was summarised within Table 36. Utilisation of E-Business varied significantly within the cases reviewed. The analysis revealed no uptake of advanced E-Business technologies such as extranets or intranets, which agreed with the findings of the quantitative survey (Section 5.1). However, all case studies had access to the Internet, utilised E-mail and a website. Undoubtedly, Internet access within Wales had improved, with widespread access now available (eCIC, 2005), which was reflected in the case studies, whereby three enterprises had recently upgraded to broadband. All Owner/Managers appreciated the advantages of broadband; comments included: -

> *"For me to trade online a broadband connection was the only viable option." (B)*

> *"Broadband offers significant advantages over ASPs, in that it is a dedicated connection and does not impact on our telephone usage, making its much quicker and more reliable." (J)*

Table 36: E-Business usage by Individual Technology

Case Study	Broad band	Internet Access	E-mail Usage	Website	Extranet	Intranet
A	✓	✓	✓	✓		
B	✓	✓	✓	✓		
C	✓	✓	✓	✓		
D	✓	✓	✓	✓		
E	✓	✓	✓	✓		
F	✓	✓	✓	✓		
G	✓	✓	✓	✓		
H	✓	✓	✓	✓		
I	✓	✓	✓	✓		
J	✓	✓	✓	✓		

Therefore, investment in broadband was recognised as beneficial, due to its significant advantages over ASPs which were now considered obsolete. This trend suggested that Owner/Managers were prepared to

embrace technological change if able to measure the attainable business benefit and costs were affordable. Access to the Internet was recognised as a valuable resource for business research purposes; typical comments included: -

> *"I use the Internet for a wide number of purposes, including research for records stock, purchasing through eBay and checking pricing of competitor sites. This information allows me to update my stock and pricing lists, making me more competitive and increasing my sales. The only method of networking prior to the Internet was through trade fairs, networking with buyers and sellers and trade magazines." (B)*

> *"The Internet allows me keep up with the latest happenings in the film and theatre worlds through a number of websites." (C)*

> *"The Internet allows me to assess the nature and demand for my Welsh dressers, in countries throughout Europe and the USA through evaluation of competitor sites and web auctions." (F)*

> *"I look for potential customers that I can target with my products. These can include restaurants, butchers shops and online farmers' markets." (H)*

Internet usage for research purposes had rapidly established itself as a new and important IA that was seldom undertaken prior to the popularisation and widespread availability of IT/IS and the Internet within the SME sector. Such knowledge enhanced business competitiveness and profitability, although it was virtually impossible to gauge the benefit gained from this activity due to the lack of evaluation undertaken by the Owner/Manager.

Within all cases, E-mail was utilised for business purposes, including communicating with suppliers and customers, answering and receiving customer and supplier queries and enquiries. In a number of cases (A, B, D, E, F and J), E-mail was identified as a significant and reliable method of business communication which had supplemented existing channels. In particular, several enterprises claimed that E-mail offered a more

reliable method of communication with suppliers than telephone, as a permanent record of the dialogue could be maintained as evidence in addition to proof of receipt, typical comments included:-

> *"We receive a lot of E-mail traffic, mainly from potential customers asking for our prices. We send them our catalogue electronically in a PDF format. This presents a quick and cheap solution which does result in new business. I think E-mail has generated more enquires than we previously received from word of mouth and traditional advertising methods." (A)*

> *"We use E-mail a lot, probably more than the telephone, it's now our main method of communication with both customers and suppliers because of its low cost and convenience to use. It's also a very effective way to send pictures to potential clients." (E)*

> *"We have used E-mail to receive bookings from clients and even send our menus. I don't think this has reduced our telephone traffic, it's just supplemented it...." (I)*

The only dissenting comments regarding E-mail usage were concerns regarding junk messages and viruses: -

> *"I am constantly deluged with junk E-mails which gives me cause for concern because of the time required to get rid of them and the threat of viruses. As a result, I have invested in anti-virus software (Norton)." (E)*

As with Internet usage, E-mail had established itself as a key working procedure and significant and accepted method of communication within all cases. E-mail use in a number of cases seemed to generate more communication traffic than traditional alternatives, e.g. increased queries and enquiries, between the enterprise and individual customers, which were not previously apparent. As with Internet use, these enquiries had the potential to turn into sales, although none of the cases surveyed were able to measure this phenomenon. The proprietor of enterprise A, estimated that one in 10 enquiries resulted in follow up trade, although the reliability and accuracy of this figure must be treated with caution as

it had no underpinning verification. No respondents identified any knowledge or awareness of CRM software throughout the interview process.

When usage over time was contrasted the general trend was for increased utilisation of the Internet and E-mail over the period. Several enterprises had graduated to broadband due to its increased affordability and availability and this had encouraged greater Internet and E-mail usage. All respondents respected the value of the Internet as an information source to aid business research and usage has correspondingly increased. Likewise, E-mail usage was recognised as an extremely beneficial and effective method of communication, which enhanced the operations of the business and had become embedded within the culture of all enterprises.

Table 37: Online Activity within the Case Studies

Enterprise	Online Sales	Online Sales outside UK	Online B2B	Online B2C
A				
B	✓	✓	✓	✓
C				
D				
E	✓		✓	✓
F				
G				
H				
I				
J	✓	✓	✓	✓

In terms of online sales (Table 37), three of the case studies undertook online selling which comprised both B2B and B2C activities. Within each enterprise, the ability to generate enquires and market their activities from their website was identified as critical. Although uptake of online sales was limited, all enterprises recognised the critical contribution that E-Business made to their business operations and that it potentially offered the opportunity to revolutionise organisational practices. In terms

of the importance of online sales, the following case studies bore relevance: -

Case study B operated a traditional second-hand record store prior to 2004. Since that date, the traditional store had closed, with all sales undertaken through the enterprise's website. The rationale for this change was realisation that the web offered an effective low cost selling medium, in contrast to the increasing costs of maintaining a traditional store. Moreover, online selling offered the potential of accessing new markets, e.g. UK, European and international that was previously inaccessible or difficult to exploit. The move proved extremely successful for enterprise B, enabling them to achieve higher sales than previously attained through traditional methods. As previously identified, enterprise B's website enabled them to operate in new markets, with approximately 15% of sales occurring in international markets. Enterprise B undertook both B2C (direct to final customer) and B2B (selling to other records dealers and shops). In addition, the change to online trading meant that the business only required a warehouse facility for the storage of records, thus offering considerable cost savings.

Within enterprise E, E-Commerce trading was considered just as significant, with complete reliance on this selling medium. When first conceived, enterprise E had not considered using E-Business as a selling channel. However, the affordability of web technology encouraged the proprietor to invest in a website with online selling capability and, although small scale, this proved a successful and growing venture. Recently, this enterprise re-launched its website, with a more sophisticated, format enabling customers to design their own product. enterprise J provided an example of a traditional enterprise that had successfully adopted online selling to supplement its traditional selling techniques, encompassing both B2C (75% of sales) and B2B (25%) avenues. Whilst the other enterprises investigated had not yet adopted online selling capability, they had all benefited in some way from E-Business. For example, enterprise A, C, D, F, G, H and I identified that

the business successfully marketed and advertised their services and products through their website, thus enabling potential trade. These comments illustrated these attained benefits: -

> *"The website is a great tool to market ourselves in an international market. At very little cost we can effectively advertise the bed and breakfast, its amenities, the location and its prices." (A)*

> *"I am a stuntman and my website allows me to promote my range of skills and talents via the multi-media features including video clips. It allows me to direct casting directors, stunt co-ordinators and agents towards my website so that they can immediately appraise my abilities." (C)*

> *"The website allows me to advertise every piece of stock (Welsh antique furniture) within the firm through several pictures and supporting descriptions. The viewer gets a very good idea about the nature of the product and I am convinced it's a key factor in selling to overseas markets." (F)*

Thus, it is apparent that E-Business offered the potential to revolutionalise business practices. In terms of E-Business impact, several key factors emerged. Firstly, all adopters considered they have benefited from usage of E-Business. All case studies, felt that their communication channels had improved by use of E-mail over the period of assessment. Similarly, all enterprises surveyed considered the use of the Internet had benefited their businesses in terms of competitor and customer research.

Recognition of more significant impact was limited. Several enterprises had experienced organisational change as a result of E-Business, most significantly enterprise B, which had transformed its business model, although the Owner/Manger had been forced into this decision by the increased maintenance cost of his traditional store. Enterprise E had re-launched its website to improve functionality and customisation facilities. However, the typical attained E-Business benefit was identified as improved trade and access to new markets, primarily as a result of increased customer access. In terms of transition within the case studies over the period of study, the enterprises recognised the opportunity that

E-Business provided and valued their websites as a marketing and advertising facility. Thus the attitudes prevalent on the return visit were more pragmatic and focused towards marketing as opposed revenue generation through online sales.

6.4 Drivers to E-Business

This section examined the motivations and key drivers for investment in E-Business. When questioned regarding their motivations, Owner/Managers identified that they invested in IT/IS to increase organisational efficiency (A, D, E, F, G), drive improvement (E, I), reduce costs (A, D, F), advance communication (E), improve the marketing of the business (A, B, J), support administrative functions (A, F) and increase sales and trade through online markets (B, F, J). Typical comments included: -

> *"I decided to invest in IT to improve my efficiency and eventually increase my sales through online trade." (A)*

> *"I saw a website as the perfect vehicle to market myself and this justified the time and cost required to set it up."(H)*

This analysis revealed that Owner/Managers were ambitious and sought to improve the efficiency of organisational processes, including communication and potentially increase turnover through online trading. The basis of these drivers seems to be focused around improvement and sustainability of existing administrative functions and the reduction of cost overheads. There was only minor consideration of the transformation of the existing business model, through the development of online sales. At the time of the second interview, these motivations remained largely unchanged, although several enterprises noted that increasing sales through online selling and marketing was becoming increasingly more significant towards their business operations.

6.5 Barriers to E-Business

The majority of the case studies identified barriers to E-Business development, with only enterprise I claiming no deterrents to deployment. Case studies A, B, C, D, E and F noted that money and cost were significant deterrents to future technological investment within the enterprise: -

> *"Money is probably my biggest factor that stops me from improving the IT/IS within the business." (B)*

> *"I would probably invest in a more complex website if I had the money to spare which I don't." (F)*

Enterprise A identified they had restrictions on growth due to premises and its location: -

> *"Having a low turnover, the high potential capital cost in investing in E-Business in contrast to potentially minimal increase in profit due to the size of the business was a deterrent to further investment. The business is a bed and breakfast and due to its location and size of premises, there is no opportunity for expansion. As a result we have a ceiling on the number of guests that we can take at any one time." (A)*

Available time was also identified as a deterrent to E-Business growth in cases A, B and J: -

> *"Running a small business means that I had limited time to explore the opportunities that E-Business offered." (A)*

> *"I have to spend a significant time on a daily basis updating my online databases with stock updates. As a result I don't have any available time for further training or development." (B)*

> *"We are so busy in manufacturing that we don't get the time to worry about IT. We stick to out strengths and leave the IT to specialists." (J)*

IT/IS skills was identified as another significant issue by enterprises A, F, G and J. It was apparent that enterprises were reluctant to invest in IT/IS training, as they were uncertain as to the organisational benefit which might occur:-

> *"At the end of the day, we have an eight bedroom guesthouse and have maximum revenue which we can achieve based on full occupancy. Our existing advertising through local tourist guides and the website enables us to achieve this as certain times during the year. Investment in IT/IS training would not result in any significant increase in profitability." (A)*

Enterprise F did recognise that improved IT/IS skills offered an opportunity for organisational gain, whilst enterprise G posited that this could be a temporary barrier which could be overcome with sufficient training: -

> *"Improved IT skills might improve the business efficiency marginally." (F)*

However, it was recognised that limitations in E-Business capabilities had resulted in lost opportunities by the Owner/Manager: -

> *"Not having online payment facilities have cost us a number of customers. However, the extra cost of this facility probably equates to the extra income that we would have generated, anyway." (A)*

Thus, the decision not to invest in this case was justified on a limited cost/benefit analysis.

In summary, it was apparent that the enterprises considered significant inhibitors to E-Business usage existed; namely finance and cost, time and deficient IT skills. Undoubtedly, there were associations between these barriers, e.g. IT/IS skills cannot be improved because of a lack of available time. To overcome these inhibitors, the SME Owner/Managers require knowledge of the benefits that can be gained from effective usage

of technology as ignorance will prevent Owner/Managers investing in technology. Attitudes towards inhibitors have changed little during the course of this study, with prevalence given to their ongoing impact. However, there was recognition that IT skills had improved in several enterprises (B, E, G, J) through self-teaching, thus increasing user competence and usage.

6.6 Enterprise Website

This section evaluated the impact upon the enterprise of its website. Consideration was given to the inspiration, purposes and uses, impact, development and ongoing maintenance, barriers and motivations and future plans associated with E-Business usage.

6.6.1 Development website maintenance

The development of enterprises' websites varied significantly within the case studies, from in-house creation (A, B, C, D, F, G and H) to employment of a dedicated web design organisation (E, I and J). The determinants of the development choice included financial, belief in own IT/IS skills and extent of knowledge regarding the medium. The Owner/Manager's of enterprises A, B, C, D, F and H identified that they had personally developed their own website because they possessed a certain level of IT/IS skills and believed that they could make a competent job of it saving money as a result.

> *"I knew what I wanted and I was confident I could produce something workable and presentable. In my opinion, this is the case and it has developed and been added to in recent years." (H)*

The comment from the Owner/Manager of enterprise H, the sheep farmer, suggested great confidence and self-belief which was obviously underpinned with competent IT/IS skills through which the website was developed. However, it was apparent after further questioning that this

individual had no prior expertise or experience in website development. Their confidence was borne out of their ability and readiness to use previously other software competently and their observation of competitor and similar websites. It was also significant that it was deemed a cost saver to produce the website independently rather than employ a specialist.

The rationale for using a web design enterprise was multi-faceted and included desire to develop a professional website, which met their objectives; comments included: -

> *"I immediately contacted a number of web design companies to undertake the process with my involvement regarding content and feedback." (I)*

> *"I do have some IT skills, but felt that the website needs to be really professional and did not feel that I could do it real justice so I asked Opportunity Wales to develop it." (E)*

In such cases, the respondents' decision was based on acceptance of their own skill and time limitations and the recognition that a professional enterprise would be more likely to produce a website that was suitable for its purpose. The initiative to utilise agencies such as Opportunity Wales suggested some knowledge or research had been undertaken to assess the most appropriate adoption decision.

Enterprises A, G and I identified that there was no ongoing website maintenance policy, with updates approximately undertaken only once or twice a year to update pictures, and prices. The reasons for this were identified as the nature of the business operation. Enterprise I, the restaurant noted:-

> *"The website does not require regular maintenance and updating because of the nature of the business (e.g. restaurant). Once a year we update the menus and prices but that's about it."*

With respondents, there was a lack of understanding regarding the potential of their websites and the opportunities they provided beyond a marketing presence. Enterprise I's website would have benefited from inclusion of increased functionality such as customer ability to place orders and reserve tables. Having invested the time, effort and money into creating a website it was considered sufficient and no further development was required. Such a strategy raises inevitable questions regarding Owner/Manager ignorance of the medium.

Several enterprises (B, C, D, E, F and J) identified a regular if informal website maintenance and content management policy, whereby the level of maintenance, e.g. daily, weekly or monthly, was dependent on the ongoing importance of the website to the business operation. For example, enterprise B identified that the website was maintained on a daily basis to reflect the latest available record stock, a critical process as the enterprise was reliant on online sales. The Owner/Manager, however noted design or website content had not altered significantly since its original launch. Similarly, the Owner/Manager of enterprise C, the Stuntman, identified a regular and ongoing website and content management policy on a weekly basis, but noted that it had become increasingly complex with more multimedia, functionality and components since its initial release.

The development, maintenance and management of enterprises' websites did not seem to occur in a structured or planned manner; decisions were made in an ad hoc manner to meet immediate operational business needs, e.g. enterprise H, the sheep farmer's website was only updated seasonally. Indeed, actual evidence of updating on the enterprise websites content identified above was minimal, suggesting that Owner/Managers were ad hoc in their maintenance strategies. Without a regular maintenance and content management policy, the threat of data redundancy within websites content was of great concern. Several websites provided evidence of obsolete or inaccurate information in terms of services offered or pricing structures (A, I, B).

> *"It gradually developed I suppose, the number of pages have increased as has the amount of information and content as we see we need it." (F)*

Attitudes over the period of study regarding website development, content management and maintenance were instructive. Several of the participants recognised the value the website brought to the business in terms of increased marketing presence, enhanced profile and online sales. As a result of this, several had re-launched their websites to fully maximise the attainable benefits. However, a number of enterprises have not maintained their websites with any regularity; indeed some seemed to have lost interest after an initial period and were indifferent towards future development. At the time of writing, all websites remained available bar two (D and H), although it was apparent that some had not been updated for several months. Enterprise D, the jeweller had gone out of business and H, the sheep farmer's website had been withdrawn for redevelopment. This evidence supported the importance of the Owner/Manager in driving the development of the website. Without this, the E-Business progression within the enterprise was likely to stagnate and even regress.

6.6.2 Inspiration and motivations for website ownership

Inspiration for development of an organisation website was varied, ranging from a combination of factors to individual drivers. The Owner/Managers perceptions of E-Business were informed from several significant external sources, including competitors, customers and the media. A typical comment included: -

> *"I think our competitors inspired me to set up a website. I also felt a bit embarrassed that I did not have a website when in conversation with my suppliers about the use of technology within my business." (I)*

The reasons for website implementation included the desire to keep up with competitors and the ambition to develop and grow the enterprise.

Such ambition was fuelled by customer prompting, observation of competitors and others practices and the media; typical comments included: -

> *"Obviously I think communication is key, but the bottom line is increased profit." (A)*

> *"I was aware of the number of businesses in the industry that were going online and I felt it offered a great opportunity, so I suppose I was self-motivated based on speaking to people in the know." (B)*

> *"The Internet provides the perfect vehicle to promote my talents to my industry and was a great opportunity to market myself effectively. I had good IT skills so it was no great effort to develop the site." (C)*

> *"People almost expect you to have a website – I know that I feel disappointment myself if I want to look at a product or service but there is no website to browse. From a marketing point of view, it is important to have an online presence which is identified within your business literature." (I)*

Thus, the usage and development of websites within "Sole-Proprietor" SMEs was largely determined by the knowledge, attitudes and effectiveness of the Owner/Manager towards E-Business. However, it was apparent that there was a lack of in-depth understanding of the terms E-Business with no differentiation between B2B and B2C trading. Closely related to inspiration for website implementation were motivations. Motivations for setting up the website were varied, ranging from: -

- key to business survival (B)
- information tool (E, I)
- increasing productivity and efficiency (A, F)
- increased revenue (C, D)
- enhanced communication and marketing mediums (B, E, G, J)
- to be seen as an innovator (B)
- to trade online (D, F).

Motivations and perceptions of Owner/Managers towards their website did change over time. More enterprise Owner/Managers identified the importance of the website as a marketing and communication medium (A, B, D, E, F, G, J) than previously, whilst enterprise B, the second hand record store's decision maker was less concerned regarding business survival or to be recognised as an innovator.

6.6.3 Website purpose and usage

The enterprises Owner/Managers were asked to identify their perceived uses of the website, four main categories were identified: -

1. To market the business within Wales, the UK and internationally and create more product and service demand. Enterprises (A, B, C, D, F, H and J) identified the importance of their website to market their products and services. Comments included: -

> *"As approximately 10% of our market is overseas, the website is a great tool to market ourselves in an international market. The website is an effective method of achieving this aim." (B)*

Thus it can be seen that the enterprises surveyed appreciated and understood the use of their websites as an effective marketing tool.

2. To act as a portal and enabler for E-mail communication was identified as an important facet of website usage (A, B, F, J).

> *"E-mail is a great method of communicating with customers. We pull in a lot of E-mail enquiries regarding the guesthouse, although I reckon only 20% of this turns into actual business." (A)*

> *"Communication from new and existing customers increased when we added an E-mail link to our website." (F)*

E-mail has rapidly emerged as a core communication system within these surveyed enterprises. Communication from suppliers and customers was encouraged by providing a linkage to E-mail systems within the enterprise website.

3. To provide information to customers and suppliers and potential business partners (A, B, E, F and J) about recent events and activities within the business.

> *"The website could be used to update customers regarding any special offers and promotions that we might be offering. For example, it might be useful around graduation time to promote the fact that we cater for family groups specifically for this purpose." (A)*

> *"Gives potential customers an idea of what to expect in terms of the appearance of the restaurant, its location and the menu." (I)*

> *"I felt it important that the website was regularly maintained and updated. If information was out of date customers would soon become frustrated and move on to a more accurate website." (B)*

Respondents were quick to identify the importance of the website in providing an ongoing link with customers and suppliers through regularly updated information. Such information would encourage customers to visit the website and potentially encourage further trade and new customers.

4. To trade online (B, D, F, H, J) and to increase enterprise sales. Several case studies identified that their website provided an opportunity to buy and sell online, which increased sales revenues, and enabled purchases off suppliers more competitively. Enterprises F and G identified that, although they did not have an online selling facility, the fact that their products and services were catalogued on the website meant that they would receive enquiries and generate sales as a result.

> *"....it's critical to the business success, without it we could not be able to trade." (B)*

In summary, analysis revealed that the majority of Owner/Managers within the case studies expected their websites to act as predominantly a marketing and information provision medium and to a lesser extent an enabler of communication and online trade. No enterprise identified any desire to attain higher levels of E-Business competency, as mooted within several prior SoGMs. Thus, it was apparent that Owner/Managers have expectations of immediate returns from their website in the form of improved marketing and communication channels and potentially increased sales. However, these responses again highlighted a lack of foresight, knowledge and planning towards their E-Business function. This evidence suggested that Owner/Managers were focusing on the immediate operational benefits of E-Business to increase enterprise sustainability, with minimal consideration of the future. Moreover, impact of their websites remained questionable and was considered within the next section.

6.6.4 Website impact

The case study respondents were asked to identify the actual impact of their website upon their enterprise. Two of the enterprises (B, the second hand record store and J, the pottery manufacturer), identified that their website resulted in significant organisational transformation and that they would not be able to survive without it, as they were reliant on online trade, a typical comment included: -

> *"The website has made a significant impact, we would have not been able to trade and exist without it having changed from a traditional storefront to online business" (B).*

Four enterprises identified a positive business impact which did not result in major organisational transformation: -

> *"I think the website has made a big difference to me. Since its launch I have doubled my income in the last year. It has given me a higher profile within the media world" (C).*

> *"The Internet plays an important role in my business, although I will always have a traditional storefront as it generates revenue and suits the nature of my business. The website allows me to access new markets and increase my sales." (F)*

Thus, it was apparent that a website provided an opportunity to change the nature of the business and trading practices. Owner/Managers identified that use of a website provided clear benefits in terms of improved marketing and promotional profile (A, B, C, F, H, J), increased supplier confidence, increased sales through online sales (B, F, J) improved communication (A, C, F) and administration practices (A). Three of the enterprises expressed their increased reliance towards website and E-mail usage. Whilst three enterprises noted that sales had increased through online trading, four others, not undertaking online selling, recognised the contribution that the website made to increased sales (F, G, H, I).

> *"Our administrative practices have changed because of E-mail, we do more business communication through E-mail instead of telephone and letter, so it's more responsive and effective I suppose" (A).*

Five enterprises identified that their website had enabled them to access new customers and markets (B, C, H, I, J): -

> *"Yes definitely, we have now got a European and international client base instead of virtually all local customers. It's still small, but growing, accounting for approximately 10% of all sales at the moment. In addition, the nature of the customer base has changed, from largely student based to the dedicated record collector of an older age bracket" (C).*

> *"For us, it's about getting access to the same type of customers in new markets." (F)*

This evidence suggested that E-Business activity has the potential to revolutionalise the business and positively impact upon turnover. However, on the negative side, several Owner/Managers (A, C, D, E and G) identified minimal changes to the type and nature of the customer that their enterprises attracted and no increase in sales: -

> *"Our customers' demographic has not changed, the website is still attracting the same type of person from the same areas, in my opinion." (A)*

> *"I have a specialist clientele; the website has improved my access to them but I don't think I'm going after different types of customers." (C)*

Thus this evidence indicated that developing a website was no guarantee of future success and the attitude, understanding and knowledge of the Owner/Manager and the nature of the IA could potentially be important determinants of business impact towards E-Business.

It was apparent that there was a lack of awareness, understanding and evaluation regarding the organisational performance of the website and most responses were vague approximations: -

> *"Quite difficult to judge, because we do not track our customers and identify where they come from. I would suspect that it has provided a quick and cheap method of informing our customers regarding our prices and the nature of the guesthouse and allows them to contact us quickly through E-mail." (A)*

The majority of Owner/Managers displayed limited awareness and a high level of ignorance regarding the impact of their website in terms of increased profitability. Only the enterprises actually undertaking any online selling were able to estimate the level of its impact. In addition, the increased marketing that was enabled from enterprise websites was not developed into CRM due to a lack of awareness and understanding of this technology. This provided further evidence of a lack of rigour and

control in terms of ongoing contingency planning and evaluation of business impact.

6.6.5 Strategic management of the website

Owner/Managers were asked to consider the strategic management of their organisational website and its future role. Half of the respondents (A, B, C, F, I) identified no consideration of website strategic planning in terms of further development or increased investment. This evidence supported the earlier literature presented within Section 3.4 that there was a lack of strategic management of the IT/IS function within the SME sector. Enterprise D, the jewellers, however, identified that they considered their website development within their business plan, because it was a requirement of a funding grant that they were seeking to obtain. Future website development was closely associated with its organisational impact (E, J) and the success of the business: -

> *"It will depend on the ongoing success of the website. I hope to develop it further and increase its effectiveness." (A)*

> *"Website expansion will depend on the overall success of the business." (D)*

Such comments suggested that Owner/Managers interested in further developing their website was closely connected to its initial positive impact on business practices and profitability and its underpinning sustainability. However, this was largely dependent on the effectiveness of the initial website development and the evaluation, if any, of its performance.

Furthermore, minimal thought was given to the future role of the website, with only enterprise G making direct reference to its ongoing influence: -

> *"To implement a new website, to advertise our website more at point of sale and to constantly update on a monthly basis, to encourage more use to develop customer loyalty through familiarity with the business." (G)*

Several enterprises identified future development plans, but not in the context of IT/IS. These responses confirmed the findings of the previous section, whereby the Owner/Managers assessed impact in terms of immediate day-to-day operational benefits that had been accrued and were more concerned regarding attaining enterprise sustainability than actively pursuing a business growth strategy. When the enterprises were considered over the period of study, there remained a lack of awareness of the process of planning the website strategically with minimal changes in planning strategy and development. Hence, the evidence suggested that there was no process of utilising E-Business strategically, within the enterprise.

6.6.6 Barriers to website development

Respondents identified a range of inhibitors to website development, including ICT infrastructure (A), cost and access to finance (A, B, D, E, F, I, J) and available time (B). Typical comments included: -

> *"As mentioned previously, the ICT infrastructure has restricted our ability to exploit the advantages of the Internet as a low cost communication media. Cost would be a significant factor, as we have not introduced an online payment system resulting in the loss of a couple of customers." (A)*

> *"Financially, an E-Commerce website can be expensive, I was quoted a ball park figure £3,000, so I need to find money to fund it." (E)*

> *"Another thing I consider is the size of the business. We are a small guesthouse and the investment in ICT*

> *will not result in any significant bottom line profit because we have a ceiling on the profit that is realistically achievable. We have no intention of moving to different business premises so growth is not a consideration." (A)*

> *"Further investment would have to be justified on a cost/benefit basis analysis. I could introduce an online database to market all the products. Currently only some of them are. I would only do this if were worthwhile financially, which would be a complex calculation." (F)*

The Owner/Manager of enterprise H was wary of over expansion by creating demand which could not be serviced due to limited stock. Only two enterprises Owner/Managers (C and G) identified that there were no barriers to website development. This analysis suggested that SME Owner/Managers believed inhibitors existed to further website development, with cost and available finance being the predominant issues. The comments suggested that the presence of these inhibitors could be a significant deterrent in future website development, which was apparent over the period of the study. Investment in website development with no guarantee of financial return was viewed as a potential threat upon the enterprise and its future sustainability. This evidence suggested that SME Owner/Managers were more concerned with ensuring ongoing business survival and sustainability than the active pursuit of business growth.

6.6.7 Website function evaluation

Section 3.7 identified good practice in enterprise websites and recognised the existence of a number of frameworks to evaluate their effectiveness. This section evaluated the websites surveyed within this chapter. To achieve this aim, it was necessary to select an appropriate framework from the extant literature. The rationale for the selection of an appropriate framework was two-fold: firstly, it had to be empirically verified and, secondly, peer-approved within the academic community (Ivory et al, 2001). As a result, Barnes and Vidgen's (2002) WebQual

index was utilised, as it was widely cited as the predominant model for website evaluation (Kuo et al, 2004; Cao et al, 2005). This framework assessed a website on three dimensions, namely usability, information quality and service interaction quality and comprised 22 questions identified within Appendix F. The first dimension assesses the usability of the website in terms of its navigation, design and appearance. The second parameter measured the quality of information provision within the website. The final parameter examined the quality of service prevalent within the website, including security and personalisation issues.

All the frameworks were contrasted and evaluated, against the Barnes and Vidgen's (2002) framework (Appendix F). Whilst this was a subjective exercise, it provided a comparative basis against set criteria, which were empirically verified, revealing examples of effective and ineffective website design. Overall (Figure 26), the analysis revealed that enterprise E, the medal manufacture (123 points) had the highest ranked website, followed by B (118), Record store and J (114) the pottery retailer. The lowest ranked websites were enterprise H, sheep farmer (66), followed by A (73), guesthouse and D (87) jewellery retailer.

When the enterprises were contrasted against the three dimensions, the following trends emerged (Figure 26). In terms of usability, Enterprise I, the Restaurant, was the highest ranked, followed jointly by E (medal manufacture), C (stuntman) and F (antique Shop). Enterprise I, the restaurant, scored highly for its usability, as its website was easy to use and navigate and had an attractive, professional appearance. The website offered simple navigation from the home page, with the site navigation driven by a straightforward onscreen menu, which activated content within the home page. The visual appearance of the website was improved by extensive use of colour images of the restaurant locality, internal décor, popular dishes, to illustrate and promote the enterprise as a high quality establishment. The site for enterprise E, the medal

manufacturer, offered a professionally designed, simple appearance, which instantly conveyed the nature of the product to potential customers through good use of text and appropriate images.

Similarly website C, the stuntman, and F, the antique business, offered attractive sites in terms of visual appearance, with competent user navigation. Enterprise C was a self-designed website, but made effective use of images, video clips and sound to illustrate the skills of the Owner/Manager. A deficiency in this website was the use of black as the standard colour scheme, which was overpowering and reduced text visibility. Enterprise F was a professionally developed site, which cultivated an image of quality, through its standard colour scheme, use of industry and trade logos and quality graphics. Navigation would have been improved by reducing the scrolling required to view content of entire pages. The worst ranking websites in terms of usability were enterprises H, A and D. Enterprise H, the sheep farmer offered a basic self-designed website that was predominantly text-driven with simplistic navigation. The website did not project an image of quality or provided any feeling for the nature of the product or service. Similarly, the websites for enterprise A, the guesthouse and D, the jewellers, projected an amateurish appearance with low quality images and poor navigation. Figure 27 identified individual website performance measured against the eight facets of website usability on a 1-7 scaling (Appendix F).

When the information parameter was appraised, enterprises B, F and J (48 points) attained the highest ratings. This was assessed by evaluating how up to date the information content within the website was and the frequency of update. Enterprise B was an online record store and utilised a daily update of available stock, plus provided linkages to other collector sites. Profiles of the Owner/Managers were provided, plus a website usage counter. Enterprise F, the antique shop, provided current information on stock, which was updated on a weekly basis, along with detailed supporting material and Owner/Manager profiles. Enterprise J, the pottery retailer, offered a sophisticated website, although navigation

was overly complicated and hierarchical. The site included a comprehensive catalogue of products with extensive use of supporting graphics, which was effective. In addition, detailed profiles were provided of the Owner/Managers and the history and development of the enterprise, which was informative and increased belief in the organisation, its products and reputation.

The weakest performing websites in this parameter were clearly enterprises A and H. Enterprise A's website was restricted to text regarding the location and nature of the accommodation at the bed and breakfast and the price tariffs were out of date. Moreover, there was no provision for checking accommodation availability and no information regarding the Owner/Managers. Similarly, enterprise H provided a minimal quantity of information, which did not inspire confidence in the website or underpinning organisation. The service interaction parameter considered the levels of perceived security, interaction and personalisation inherent within websites. This parameter proved the most difficult to measure, as a number of criteria were not eligible in all cases as some enterprises did not trade online. However, it was apparent that there was a range of performance within this variable, with enterprises B and E the highest ranking (29 points) and C and G the weakest (seven points). Enterprise B, the second hand record store, identified the trading conditions through a trading agreement, stated the level of security for online payment, and enabled specific search facilities on various criteria. In addition, the enterprise provided weekly newsletters and competitions for online subscribers to the website.

Enterprise E, the medal manufacturer offered an innovative website, which enabled potential customers to design their own product, as well as a secure online payment system. By contrast, enterprise C, the stuntman, acted purely as a marketing and promotional site and offered no opportunity for customer interaction or electronic trading. Enterprise G, the egg farmer, provided minimal service interaction potential, although it did include a facility to present the site bilingually and offered a

feedback window to visitors. In summary, the Barnes and Vidgen (2002) framework proved a useful mechanism to appraise website effectiveness in terms of usability, information and service interaction. The more sophisticated websites utilised site navigation, presented the image of the organisation, were up to date and offered accurate and complete information, were secure, and offered some form of customisation, community and personalisation.

Figure 26: Website Performance Evaluation

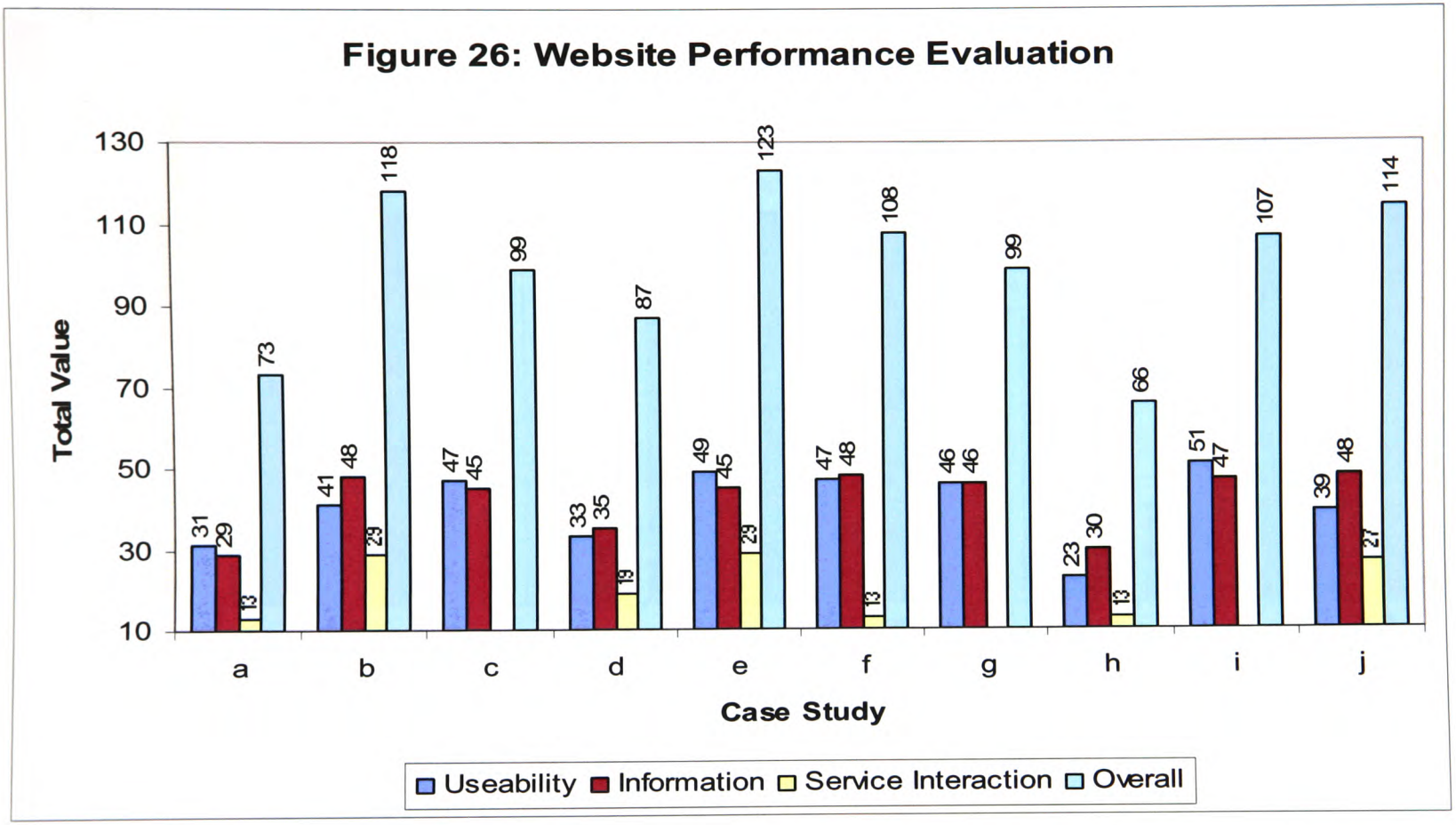
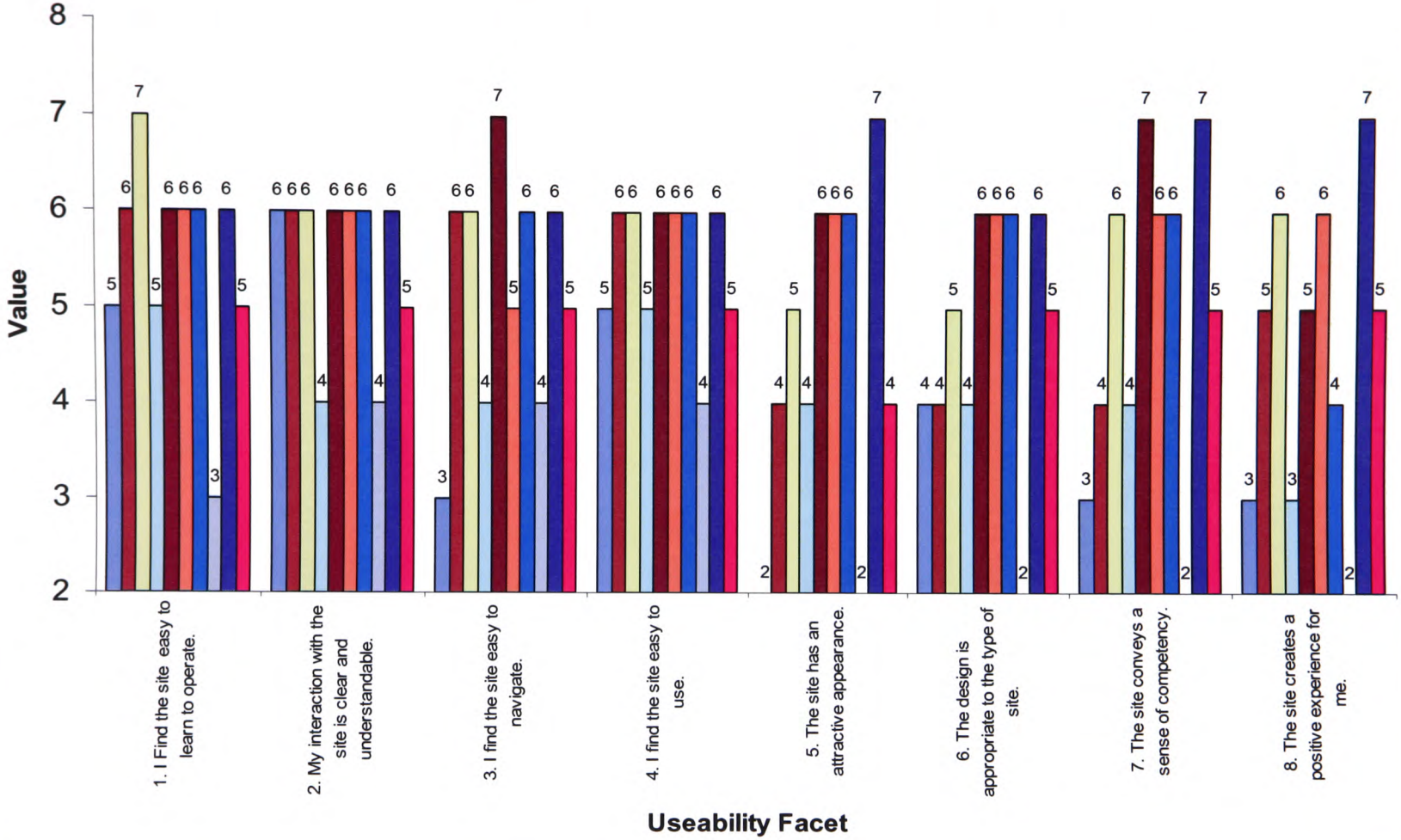


Figure 27: Line Chart Illustrating useability levels of Case Studies



Enterprises B, E and J were all able to communicate the vision of their enterprises through their website design. In the case of enterprise B, the second hand record store, this was done in a rather whimsical, but engaging manner, with self-deprecating humour. This style was attractive and suited the nature and culture of a second-hand record store. Similarly, enterprise J, the pottery retailer, provided a personal and somewhat cluttered website that projected the image of the enterprise as a promoter of Welsh culture. Enterprise E, the medal manufacturer, had a relatively simple site in terms of appearance but highly effective in promoting and offering advanced individual customisation facilities.

Poor website performance was evident in enterprises H, the sheep farmer and A the guesthouse, where there was limited investment, upgrade and upkeep of the website. They were typically regarded by the Owner/Manager as a marketing facility or were reluctant to invest further money without significant returns. Weaker sites suffered from poor navigation, inflexible design, inaccurate information and a lack of interaction, inherent in construction. These issues suggested a lack of understanding and appreciation of the website as a key business process which was of strategic importance to the business model.

6.6.8 Website development

Several of the case study enterprise websites presented evidence of stagnation and even regression over the period of study. Based on Burgess et al, (2006) framework to classify website development, it was evident (Table 38) that only one enterprise (E) demonstrated a significant improvement in its website capability and complexity. This website was professionally redeveloped and enabled individual customer selection and customisation of the product. Five of the case studies' websites provided some evidence of minor enhancements through improved and updated content. One website (G), recently re-launched, although more professional in appearance and clarity lacked sophisticated E-Business

functionality. Two of the websites appeared dormant (A, I); one had been removed for a significant period of time due to reconstruction (H) and one had ceased to operate with the closure of the business (D).

Table 38: Website Status

Case Study Identifier	Enterprise Description	Status	Nature of Change
A	Guesthouse	Dormant site	None
B	Second-hand record store	Content update	Minor
C	Stuntman	Incremental change	Minor
D	Manufacture and sale of jewellery	Dead site	Detrimental
E	Manufacture and sale of bespoke medals	Major redesign	Significant
F	Antique shop	Content update	Minor
G	Egg production and Sale	Major redesign	Minor
H	Sheep farming and sale	Under reconstruction	Detrimental
I	Restaurant	Dormant	None
J	Manufacture and sale of pottery	Content update	Minor

As can be seen from the evidence within the case studies, several enterprises' websites had not led to increased E-business sophistication, adoption and growth, but to a decline. These unsatisfactory results could potentially be attributed to the role of the Owner/Manager of the SME and their level of understanding and knowledge of E-business technology. Moreover another key detriment of successful deployment of a website and other E-business technology would be its strategic management which is considered in the following section.

6.7 Strategic Management and Planning of E-Business

This section considered the level of strategic management and planning prevalent within the surveyed enterprises. The level of planning of the E-Business function was critical to its successful deployment and development (Section 3.4). Fifty per cent of the case studies (A, B, F, I

and J) revealed no E-Business planning process was undertaken. Typical comments included: -

> *"We do not plan our IT usage. I am reasonably competent with good IT skills so I appreciated what benefits it would bring. However, I freely admit that I do not consider the development of IT in a strategic way which probably means that I miss a trick or two." (A)*

> *"If I am truthful, the answer is no, I don't have an ongoing plan in terms of IT. The business is very successful and has grown to its optimum size. We are trading at the same premises as we have for 30 plus years and I am not going to change now! Our customers are mature and typically middle-aged with computer skills and regular access to the Internet and, given the cost of our products, we cater for the top end of the market. We upgrade our IT when and if we need it. I guess I replace my computers every four or five years, depending on their reliability, speed etc. The website was introduced because we identified the opportunity to market the business stock. It will be developed further, if I see the need. I make this call on a cost against value judgement. On going survival is our key determinant." (F)*

> *"I don't have a year-to-year plan. The website was created a couple of years ago and added to in recent years. I can't say there has been a strategic planning process, it's all informal and based on discussions between the three of us." (J)*

These comments suggested that such enterprises had no desire to pursue business growth, only maintain and sustain the existing business model. When asked to consider the future plans regarding IT/IS, enterprise B noted that this would only occur if they had available finance to invest and this would be decided on a short-term basis. Similarly, enterprise A identified that further IT/IS investment would occur to support a change of business emphasis and if the local telecommunications infrastructure improved.

> *"My planning is done on a very informal basis, to be honest. I tend to consider the business and its needs on a day to day basis as opposed to having a clear long-term planning process. For me, it all about here and now, sustaining and hopefully growing the business." (B)*

As can be ascertained, the above comments suggested an informal and ad hoc planning process driven by day-to-day needs and Owner/Manager perceptions, resulting in limited adoption of advanced E-Business within individual enterprises. Within such enterprises, consideration of business survival and sustainability seemed to be the most important considerations. By contrast, enterprise C, D, E, G and H answered in the affirmative that a formal planning process for IT/IS existed; typical comments included: -

> *"Yes, I realise that I need a capable high specification computer and broadband connection. These costs are factored into my business on an annual basis." (C)*

> *"Yes, would like to invest in a more professional-looking website, to attract customers." (D)*

Whilst the comments above imply a willingness to initiate a formal planning process, the evidence presented of how and why to plan was vague, lacked detail and any significant empirical underpinning. Thus, E-Business planning process remained largely ad hoc, unstructured and represented, at best, little more than a limited and optimistic wish list with no time scale for implementation. This behaviour was witnessed as an ongoing trend throughout the study. Such comments provided further evidence of the naivety and ignorance regarding effective E-Business deployment within the SME "Sole-Proprietor" sector and a lack of awareness regarding the process and need for a formal planning processes.

6.8 Website Development and Growth

All of the case studies were revisited within an eighteen-month timescale from the initial visit to establish the development and growth that had occurred from E-Business since the initial visit. Overall the results of this interview were disappointing, with the follow up revealing minimal value in terms of ongoing development. Since the initial interview, and at

the time of submission of this thesis, two of the enterprises had undergone a significant growth expansion in terms of number of employees (G and H), one has undergone a transformation in terms of trading pattern (B), and one had ceased trading (D) reflecting the transient nature of the SME.

It was apparent that a number of enterprises (A, D, G, H and I) had remained static in their use of E-Business and even regressed in some facets. Regression was apparent where there had been an initial website investment and thereafter minimal maintenance or updating of content. One website (H) was no longer available on the Internet despite the business still successfully trading. The Owner/Managers were aware of its existence but identified its updating was not considered a priority as time for maintenance was limited. Owner/Manger comments included: -

> *"Little has changed I suppose. We still use the same computer, software and website. The website was updated a number of months ago to improve the quality of the pictures of the hotel. However, I have not updated the site with this season's price yet, it's something I need to do." (A)*

> *"I changed my ISP to broadband and have not got around to sorting out the website. I think I will get someone to develop a new professional website when I get around to it." (H)*

Within these enterprises, there seems to be a reluctance to embrace the opportunity that E-Business offered their enterprises. Despite the enterprise investing in a website there was a lack of understanding and high level of ignorance regarding the ongoing maintenance and development required to encourage website usage and improve its functionality. The website was not viewed as key to business sustainability and was largely ignored. By contrast, four enterprises had fully embraced their websites within their business culture (B, E, F and J). Enterprise E had re-launched its website as a more sophisticated presence capable of enabling customer interaction in the choice and design of the product. Similarly enterprise B, F and J's websites

emerged as important functions within their overall business operations contributing significantly towards sales and marketing and providing access to new markets. Representative comments included: -

> *"There was obvious trepidation moving from a traditional selling storefront to a pure online operation. However it has been relatively painless and the business is thriving. We are getting new customers from all over the place. The website has helped but you still need to be efficient and knowledgeable in this business." (B)*

> *"The website has been quietly effective. It provides an effective method of marketing our products on a global market (e.g. the USA). We have definitely sold a number of dressers through initial contact from the website so I am delighted with it." (E)*

Thus, overall further development of E-Business within individual SMEs had been minimal and restricted to minor improvements and in one case a re-launch of the enterprise website. Five enterprises use of technology had peaked and even declined. Four enterprises continued to embrace the use of technology and have benefited in the form of increased sales and new customers. The key factor remained the stance of the Owner/Manager and their knowledge and perception of IT/IS and their willingness to embrace technology as a central mechanism to the enterprise. These findings did not support a progressive linear model for E-Business adoption within this micro-sized SME sector rather one based on SMEs attaining a level of sustainability focusing around IT/IS practices that presented immediate operational benefits.

6.9 Conclusions

This chapter has presented a diversity of E-Business experience and practice from a range of SME "Sole-Proprietor" business sectors. Overall the evidence captured supported the findings of the quantitative survey in that the sector was not maximising the full potential of E-Business. Analysis revealed a spectrum of impact, ranging from E-

Business changing the nature of the business model to minimal perceived impact besides communication, marketing and information gathering. However, as within the quantitative survey there was a lack of utilisation of sophisticated technologies such as CRM (Section 6.3). It was apparent that, within some enterprises, there was a lack of awareness and knowledge regarding the potential of E-Business to improve organisational competitiveness and efficiency. It was not perceived as an agent of change to achieve future prosperity (Levy and Powell, 2003).

In addition, within all enterprises surveyed, there was a lack of evaluation, monitoring and understanding of the impact of E-Business upon business practices. Both of these factors contributed to the limited uptake of E-Business, alongside the lack of strategic planning of this key business function. It was apparent that "Sole-Proprietor" SMEs did not operate long-term planning frameworks, focusing instead on key day-to-day operational issues as mooted within the quantitative survey (Section 5.1).

Investments in E-Business were only undertaken if clear and immediately attainable benefits were achievable and finance readily available. This evidence suggested that the Owner/Manager of the "Sole-Proprietor" SME was predominantly focused on business sustainability and did not actively consider or pursue growth but were intent on maintaining organisational sustainability. Consequently, progressive and ongoing investment in E-Business was constrained until it was readily attainable in terms of cost and perceived organisational value. However, E-Business had impacted positively on all enterprises in the use of the Internet as a research tool, and the increased use of E-mail to become a predominant method of business communication.

This chapter recognised the existence of drivers and inhibitors to E-Business, as confirmed within Figure 13. It is apparent that key inhibitors to E-Business existed in the form of financial, cost, time and

skills barriers. Owner/Managers were reluctant to overcome these barriers, due to a lack of knowledge and understanding and, in some cases, a lack of applicability of E-Business to their business model (Tagliavini et al, 2001). In some cases, it was apparent that there was a definitive ceiling in terms of attainable benefit that could be achieved from additional E-Business investment.

For example, certain business models did not require online sales, a restaurant or tradesperson. Such enterprise forms, however, would benefit from improved communication, responsiveness and marketing that embracing E-Business would provide such as direct table bookings for a restaurant. The case studies provided limited evidence of the potential for organisational transformation as a result of E-Business utilisation. Unfortunately, more evidence was provided of ineffective usage and development of IT/IS.

Within the majority of the cases, there was minimal change in the uptake of IT/IS during the course of this study, evidence of only minor or insignificant organisational benefit and apparent signs of Owner/Manager neglect. This was most prevalent within enterprise websites in the form of long-term neglect of website content updates and maintenance. At the time of submission, one enterprise had gone out of business (D, jewellery enterprise) and one website had been withdrawn for redevelopment (H, sheep farmer).

Thus, the ability of the SME to successfully integrate E-Business was a complex and multi-faceted scenario, within which the Owner/Manager was a critical component. The examples of successful and more advanced E-Business adoption cited within this chapter were reliant on the enthusiasm, commitment and initiative demonstrated by the Owner/Manager to drive improvement and usage, plus the relevance of the business model. The growth patterns of E-Business within these "Sole-Proprietor" enterprises were minimal with evidence of a plateau

effect whereby enterprises adopted a certain level of attainable IT/IS, typically a website, but did not develop significantly beyond this point due to largely internal issues and the attitude of the Owner/Manager.

The case study websites were evaluated for usability, information quality and service interaction. The appraisal of the case study websites revealed examples of good and bad practice. Interestingly, three of the top five ranked websites were professionally developed. In these cases, the website development organisation assessed the requirements of each enterprise by interviewing the Owner/Manager. As a result, it is not surprising that these websites were more effective, as a basic analysis exercise had been undertaken and the needs and requirements of each enterprise identified.

Thus, these websites were realistic in construction, contained the appropriate functionality, portrayed a professional appearance and met the needs of the enterprise. The most effective websites (E, B and J) utilised effective site navigation, effectively presented the image of the organisation, were up to date, offered accurate and complete information, were secure and provided a level of customisation, community and personalisation. Poor website performance was apparent where there was a limited investment, content management and maintenance strategy (H and A). Overall, it was apparent that there was a lack of awareness, evaluation of websites and strategic management of the process.

This chapter provided significant evidence regarding the motivations for adopting and developing E-Business within the "Sole-Proprietor" sized SME community. The central importance of the Owner/Manager was established as the key driver to successful usage. Key issues arose within the attitudes of the Owner/Managers towards usage of more sophisticated levels of E-Business. Limited knowledge and understanding and high level of ignorance remained a key deterrent towards effective usage and further adoption. In addition, limitations in time and finance were

viewed as restricting higher levels of effective deployment. It was apparent that several Owner/Managers were not actively pursuing E-Business growth and were content for their enterprises to remain at their current size and turnover.

Such enterprises were regarded as lifestyle choices, which maintained a level of income for the Owner/Managers without the necessity for significant further entrepreneurial activity or commitment. As a result, there was a reluctance to consider the financial investment in IT/IS as this was associated with business growth and a potential change in lifestyle for the entrepreneur. There was a need to inform Owner/Managers attitudes regarding the efficiency benefits that were attainable from E-Business usage to improve enterprise sustainability and profitability without actively pursuing growth.

The evidence presented within this and the previous chapter informed the construction of a model identifying the key variables influencing E-Business usage within the "Sole-Proprietor" sized SME sector. The next chapter compiled the key evidence presented within the previous two chapters and contrasted the results against the extant literature presented within Chapters Two and Three.

Chapter 7:

Analysis, Interpretation and Conclusions

Chapter 7: Analysis and Interpretation

This chapter concluded this study and served several purposes. Firstly, it has identified the key implications that emerged from the extant literature. This process was initiated by the review of the IT/IS and E-Business literature undertaken in Chapters Two and Three which was informative in providing context and focus for the study. Secondly, it identified how the research aims had been fulfilled. To achieve this, the primary research was analysed and contrasted against the extant literature discussed within Chapters Two and Three to evaluate E-Business impact on the micro-sized SME.

In each case the extent to which the results confirmed or refuted the extant literature discussed within this thesis were examined. Thirdly, it drew conclusions on the significance of the thesis and its impact on key groups involved with E-Business deployment in the SME community. Fourthly, the research appraised the contribution to knowledge that had been achieved within the field. Fifthly, the limitations of the study were recognised. Lastly, the thesis identified how this research would be exploited. The following section summarised the key issues that emerged from this literature.

7.1 The Literature: Key Issues

Usage of IT/IS has increased within the SME sector since the widespread availability of the PC in the 1980s (Cragg and King, 1993). Unfortunately, the evidence suggested that IT/IS potential to increase enterprise profitability and effectiveness (Levy et al, 1999) was not being achieved (Sweeney, 1996; Dhillon, 2005), as there was a tendency to deploy only within an operational and administrative context, despite the benefits of utilisation (Doukidis et al, 1996; Fink, 1998; Johannessen et al, 1999; Beheshti, 2004; Love et al, 2005). Several inhibitors/barriers to successful IT/IS exploitation were recognised, including limited financial resources, time and knowledge and skills (Binks and Ennew, 1996;

Anckar and Walden, 2001; Barry and Milner, 2002) which could deter an SME from increasing usage (MacGregor and Vrazalic, 2005). A key factor in the effective deployment of IT/IS was recognised as the role of Owner/Managers (Iacovou et al, 1995) and their perceptions and knowledge regarding its usage. The literature suggested SME Owner/Managers were typically ineffective strategic planners, especially in terms of IT/IS deployment (Hagmann and McCahon, 1993; Fink, 1998; Bridge and Peel, 1999), although it was recognised that there was a necessity for further on-going research (King et al, 2000).

This discussion has widened following the increased business usage of the Internet and the emergence of E-Business and E-Commerce technologies within the SME sector. It was apparent that the same picture was emerging within the E-Business literature in terms of the SME sector. The SME sector has remained cautious regarding investment in advanced E-Business (Poon and Swatman, 1999a; Drew, 2003), despite its potential as a major change mechanism (Levy and Powell, 1999). Known benefits of E-Business deployment were identified, including accessibility to previously unexploited national and global markets, customers and suppliers (Brunn et al, 2002; Anckar, 2003; Dholakia and Kshetri, 2004), increased accessibility and convenience (Lin and Hsieh, 2000; Raisinghani et al, 2005) and improved communication (Sillence et al, 1998; Kaynak et al, 2005).

As within the IT/IS literature, several sources (Debreceny et al, 2002; Stockdale and Standing, 2004; MacGregor and Vrazalic, 2005; Wymer and Regan, 2005) recognised the existence of inhibitors to E-Business usage, which would delay or even halt adoption. These included factors such as available skills (Hughes et al, 2003; Barnes et al, 2004; Fink and Disterer, 2006), finance and cost (Anckar, 2003; Hollenstein and Wörter, 2004) and time required to implement and maintain an E-Business presence (Davies et al, 2005; Ritchi and Brindley, 2005). Jones and Mohon (2005) and Fink and Disterer (2006) identified a deficiency in

research investigating E-Business exploitation within the SME sector and the influence of inhibitors/barriers and drivers to E-Business.

The key to successful E-Business exploitation, as with IT/IS usage has remained the role of the Owner/Manager within the enterprise. Fillis and Wagner (2005) and Burns (2006) recognised the existence of lifestyle enterprises, which were only prepared to pursue growth to a certain level, due to the attitude of the Owner/Manager and nature of the business operation. Moreover, the commitment, understanding and support of the Owner/Manager were essential elements to the successful utilisation of E-Business technologies (Jeffcoate et al, 2002; Rodgers, et al, 2002). Thus, it was apparent that the SME sector continued its adoption process of E-Business technologies (eCIC, 2005), although the effectiveness and extent of this action has remained questionable and dependent on the capabilities and intent of the Owner/Manager. Typically, the adoption process initiated by the Owner/Managers was impaired by limited knowledge of E-Business technologies and a lack of strategic management of the process (Doherty et al, 2001; Sadowski et al, 2002).

Limited strategic management was a characteristic of the SME community where evidence suggested that Owner/Managers functioned on a day-to-day key operational basis without reference to mid or long-term planning frameworks (Ballentine et al, 1998; Bridge and Peel, 1999). Furthermore, the SME sector, particularly the micro-sized classifications, namely the "Sole-Proprietor" and "1-9" groupings, were characterised by endemic business closure rates (Section 2.3; SBS, 2005b). To increase the effectiveness of the technology adoption process, SMEs were encouraged to adopt E-Business by modelling their operational practices against growth models proposed by public and private sector bodies. Thus, SoGMs models were frameworks constructed to represent the developmental process of E-Business, noted within Prananto et al, (2001). As identified within Section 2.9.2, the theoretical basis underpinning such frameworks typically dated to the mid 1970s Nolan model (Nolan and Gibson, 1973) designed to chart

IT/IS growth within large organisations. Several such frameworks were proposed within the academic and private sector as effective roadmaps for E-Business adoption. There was significant evidence to question the validity and applicability of such frameworks and their representation of the E-Business adoption process within the SME sector (Chong, 2004; Lefebvre et al, 2005). The emergent literature identified a lack of relevance of such frameworks for the SME sector, particularly the micro-sized classifications. To understand SMEs usage of E-Business, it remained essential to explore utilisation within the sector in a regional context to appreciate the salient factors underpinning usage.

7.1.1 E-Business usage trends within Wales: a regional context

To provide focus for this thesis, the phenomenon of E-Business usage was investigated within a regional context, in this case Wales. Eighteen academic and private sector surveys investigating E-Business usage within Wales since 2000 (Section 3.8) were appraised. The measurement of E-Business uptake within these surveys varied significantly, due to the contrasting nature and size of the samples deployed. For example, the DTI (2004) study included 25% of non-SME classified enterprises and there were differing definitions of SME sized-classifications employed within the DTI (2004), FSB (2004) and eCIC (2005) surveys, as well as an under-representation in terms of the Welsh SME population of the "Sole-Proprietor" micro-sized sector. Moreover, the DTI surveys (2000-2004) were based on a sample size of 200 enterprises in comparison to the eCIC (2003-2005) reports, which were in excess of 2,500 respondents. Therefore, all surveys presented an overly optimistic picture of E-Business usage and their results should be accepted with caution, especially the DTI surveys. Consequently, it was necessary to undertake a representative study of the SME community in Wales, to enable comparative analysis against the prior surveys.

Chapter Five presented the results of the quantitative survey, which when contrasted against prior studies, several observations were apparent.

Overall, the survey revealed lower utilisation levels of E-Business than prior studies, such as eCIC (2005) (3.8.3-3.8.5). This, undoubtedly was a result of the high proportion of "Sole-Proprietor" (34%) and "1-9" (44%) micro-sized enterprises included within the survey. Statistics charting Internet access, use of LANs, WANs, intranets and extranets, were comparable with recent studies (eCIC, 2005), although typically with lower levels of utilisation. Specifically, use of websites (38%), E-mail (48%) and online trading (five per cent) were significantly inferior than the levels reported within Section 3.8. These results could be attributed to the representative nature of the sample population surveyed. These statistics suggested that sophisticated use of SME E-Business usage within Wales was limited, especially within the micro-sized population. Indeed, utilisation of basic levels of IT/IS were disappointing, with 29% of all enterprises surveyed reporting no deployment. This evidence required further investigation of SME Owner/Manager attitudes, knowledge and understanding influencing E-Business usage.

The quantitative study revealed high dependency on local trading markets within Wales and minimal exploitation of external markets (Section 5.1.2). Such activity suggested SME Owner/Managers within Wales had limited growth aspirations, despite the undoubted potential of the E-business technologies to increase profitability, which accorded with prior studies (NOP, 2000; eCIC, 2005). Indeed these results agreed with Storey (1994) and McMahon's (1998) earlier work regarding generic business growth that identified that the majority of SMEs experienced minimal or no growth. Whilst this statistical mapping of E-Business utilisation was informative, it did not provide in-depth understanding of the Owner/Manager attitudes towards usage within the individual enterprise. The following sections considered how the research aims had been fulfilled.

Before examining the evidence from the findings of this thesis, it was worth restating the research questions outlined within Section 3.10 namely:-

1. Identify and evaluate key factors associated with effective E-Business adoption and usage within SMEs in Wales.
2. Critically evaluate and contrast the usage of E-Business within micro-sized "Sole-Proprietor" SMEs against other SME size classifications to identify key variances in behaviour and practices.
3. Develop a conceptual model illustrating the key actors and micro and macro relationships within the E-Business environment for the micro-sized "Sole-Proprietor" SME classified enterprises from the perspective of the Owner/Manager.

7.2 Fulfilment of Research Aims

The three broad aims set out in Section 3.10 were fulfilled within the strict validity and reliability criteria expected of a thesis of this type. The first aim recognised and evaluated factors associated with E-Business usage within the SME community, which was considered in the following section.

7.2.1 Research Aim One: Identify and evaluate key factors associated with effective E-Business adoption within SMEs in Wales

This research objective was fulfilled by collating information from several sources. Firstly, a thorough literature review was undertaken of academic and other sources and presented within Chapter Three. Overall, the literature revealed a lack of in-depth research investigating E-Business usage in the context of the SME sector. The review of existing surveys highlighted the poor performance of Welsh SMEs in contrast to the rest of the UK in E-business usage. The review

highlighted the lack of statistical representation of the numerically significant SME "Sole-Proprietor" micro-sized sector. To further understand and illustrate the reasons underpinning usage within this SME micro-sized group, a series of in-depth longitudinal case histories were undertaken within ten "Sole-Proprietor" classified enterprises. These cases confirmed a spectrum of usage, although overall there was minimal utilisation of sophisticated E-Business technologies such as CRM.

Key factors influencing the adoption of E-Business within the SME sector were identified, including drivers, inhibitors, perceptions and the levels of strategic management of the function from the quantitative survey undertaken, and presented, within Chapter Five. These factors were also identified as significant influences on the E-Business environment within prior surveys and extant literature recognised in Section 3.8. The following sections evaluated the importance of each of these factors on effective E-business deployment within the SME community.

E-Business drivers and inhibitors

Previously, Gibbs et al, (2003) recognised that SME Owner/Manager knowledge of E-Business benefits acted as a driver to further usage and adoption. The results of the quantitative survey confirmed this, identifying nine key drivers to E-business usage (Section 5.1.7). In the survey 31% of the population responded; respondents were typically SMEs with an established E-Business presence, such as a website. This response suggested a high level of ignorance amongst the SME Owner/Manager population and limited awareness and knowledge of the opportunity that E-Business provided. The most significant drivers were identified as:-

- the opportunity to access new marketing media
- improve the communication of information with key parties

- access new markets
- and maintain parity with competitors.

These drivers were previously recognised in studies such as Barry and Milner (2002) and Lane and Stolting (2005).

Within the "Sole-Proprietor" micro-sized SME sector, the most significant issues involved accessing new markets, suggesting that the Owner/Manager motivations underpinning usage remained idealistic, as opposed to a pragmatic understanding of the role of E-Business.

A minority of Owner/Managers considered E-Business as an agent of change, capable of enhancing key business functions and operational profitability. The case studies of "Sole-Proprietor", micro-sized enterprises investigated only organisations with an established IT/IS presence. These enterprises produced contrasting results, with greater precedence awarded to the immediate necessity to increase enterprise profitability, efficiency and effectiveness thereby ensuring ongoing operational sustainability. However, as within the quantitative survey, improved marketing and access to new markets was recognised as a significant motivation for E-Business usage.

These results concurred with the literature, identified within Sections 3.5 and 3.6, which suggested that the SMEs Owner/Managers' key drivers underpinning E-Business usage attitudes remained aspirational and associated with the potential for achieving organisational change. Moreover, the low response to this particular question, with only 31% of the survey population responding, suggested E-Business awareness remained low and an ongoing issue within the SME community. The actual attainability of this driver was questionable and dependent on factors such as Owner/Manager knowledge and understanding of E-Business, levels of investment, applicability to the business model and degree of strategic deployment undertaken.

In summary, it was apparent that positive perceptions and knowledge regarding E-Business, acted as an enabler and driver to increased utilisation and uptake for SME Owner/Managers, as proposed within Poon (2000) and Croll et al, (2001). Such knowledge and understanding of E-Business, however, was the exception, suggesting the majority of SMEs, especially the micro-sized classified enterprises, remained largely ignorant to its benefits. Evidence from both survey and case study suggested that established IT/IS users considered E-Business as a method of enhancing organisational effectiveness, thus ensuring business sustainability. This evidence highlighted the lack of E-Business knowledge within the sector, which negatively influenced utilisation and further uptake. The primary evidence supported the proposition that E-Business drivers acted as an enabler to usage and further adoption within the SME community, and should be considered within a conceptualisation of the environment, as discussed within the third research question.

In addition to drivers, the literature (Sections 3.3 and 3.5) identified the existence of significant inhibitors to the use of E-Business in SMEs. Within the quantitative survey, the most prevalent of these were time to develop and maintain an E-Business operation, insufficient IT/IS skills, low usage by customers and suppliers and dissatisfaction with financial resources. Analysis of the "Sole-Proprietor" sector revealed similar issues, with the most significant inhibitors being time to develop and maintain an E-Business operation, a lack of IT/IS skills and insufficient financial resources, which accorded with the literature identified in Section 3.6. Less prevalence was awarded to issues such as limited information, advice and support, confidence and understanding and awareness. What the existing literature did not provide significant clarity upon, was the nature of the inhibitors impact upon the enterprise. Within the survey and case study findings, the evidence suggested the existence of initial inhibitors to E-Business, whereby the SME Owner/Managers had to acquire understanding and awareness of the relevance of E-Business to their enterprise's practice. Thereafter, there were ongoing

inhibitors, such as available time and finance which affected the ability of the enterprise to further implement, resource and maintain an effective E-Business operation (Jones et al, 2003b).

Similarly the case study analysis confirmed the existence of E-Business inhibitors, with only one enterprise (I) refuting their presence. The most prevalent inhibitors were identified as financial resources and cost (A, B, C, D, E), available time (A, B, J) and limited IT/IS skills (A, F, G, J), which concurred with the prior literature identified in Section 3.6. Undoubtedly, relationships existed between these inhibitors, e.g. a lack of time contributed to the inability to provide enterprise training and insufficient financial resources restricted payment for external training provision. The case study evidence suggested that reality barriers (e.g. limited financial resources, time) could place a ceiling on enterprise E-Business usage and utilisation (as within enterprises A, B, C, D, F, H, I and J).

The enterprises evaluated within the cases studies, had largely overcome the initial perception inhibitors to E-Business, by implementing a website. However, the effectiveness of this process suggested a disparity in knowledge and understanding among the Owner/Managers, which influenced the further development, adoption and growth of the E-Business function. An example to illustrate this process would include the further development of a website, if its initial design and development had not been effectively implemented or strategically deployed. Ineffective website design and limited Owner/Manager understanding and knowledge, often resulted in minimal impact on operational practices and turnover, which led to a decline of interest and thereafter diminishing usage.

Within the case studies, only enterprises B, E and J had enhanced their E-Business model to enable online trading. The impact of E-Business inhibitors, through initial and ongoing impact, and the nature of their effect, through reality and perception inhibitors, was confirmed within

these findings and accorded with the evidence presented in Jones et al (2003b) in a pilot study to this thesis. Similarly, Fillis and Wagner (2005) noted that some SMEs were only prepared to grow to a certain size due to the influence of inhibitors. Therefore, it was recognised that their existence would be apparent within a conceptualisation of the E-Business SME environment, presented in Section 7.2.3.

SME Owner/Managers perceptions of E-Business

This factor revealed a close overlap with the previous section in terms of drivers and inhibitors to E-Business usage. Within the quantitative survey (Section 5.1.8), respondents were asked to consider the current and future benefits attainable from increased E-Business usage and adoption. Previously, Beckinsale and Levy (2004) and Simpson and Docherty (2004) identified that positive Owner/Manager perceptions to E-Business were a significant driver to effective adoption and usage. The responses revealed a greater focus on immediate attainable benefits, such as improved advertising, access to information, increased revenue and improved communication as recognised in Timmers (1998).

Future benefits were identified as new methods of marketing and advertising, reduced cost of communication with customers and increased revenue. Less significance was awarded, both currently and in the future, towards attainment of higher level E-Business benefit, such as organisational transformation and enhanced business partnerships. Within the case study analysis, the Owner/Managers identified benefit from E-Business deployment, in the form of enhanced communication systems and use of the Internet as a research facility. Significantly, this evidence suggested that SME Owner/Managers remained predominantly focused on key day-to-day operational processes concerned with maintaining enterprise sustainability, with minimal consideration of future strategic E-Business development.

Significant examples of organisational transformation of the business model, due to E-Business usage, were limited to two case study enterprises. Enterprise B changed its business model from traditional to online selling, although the Owner/Manger was forced into this decision by the increased maintenance cost of the traditional store. Enterprise E re-launched its website to enhance functionality, enabling online trading and individual customisation and design features. Overall, within the case studies, the more typical perception of the value of E-Business to the enterprises was improved trade, due to access to previously inaccessible markets and customers through website marketing. This supported the evidence that emerged from the quantitative survey, whereby the Owner/Manager was predominantly concerned with immediately attainable, operational benefit, as opposed to longer-term innovations that might transform the business model.

In summary, it was apparent that SME Owner/Managers had positive perceptions towards the benefit provided by E-Business usage. However, the Owner/Manager perspective that was typically held, was recognition of short-term benefit, as opposed to long-term impact. For example, there was recognition of benefit that E-Business provided, in terms of immediate contribution to improved communication and marketing functions, as previously recognised by Daniel and Grimshaw (2002). There was minimal evidence of advanced E-Business enabling organisational transformation, with only one example of an enterprise changing its business model significantly, suggesting a trend towards short termism, instant profit orientated strategies with a view to ensuring business sustainability. Such a focus mirrored the research of Fink (1998) and Ferneley and Bell (2005) who recognised that IT/IS decision making in the SME, was a short-term reaction to immediate pressures and reliant on intuition and instinct. This evidence also indicated a need to improve the levels of E-Business skills and knowledge of the SME Owner/Manager population to positively accept and understand the benefits of adoption and usage.

These findings supported the importance of the Owner/Manager in facilitating the advancement of technology (Mazzarol, 2004), with uptake dependent on its immediate contribution to enhanced organisational processes and short-term profitability, plus the guarantee of ongoing business sustainability. Such attitudes would potentially negatively influence the pursuit of enterprise growth (Dobbs and Hamilton, 2007). Thus the evidence suggested that Owner/Manager attitudes to E-Business usage and deployment were associated with immediate contribution to operational effectiveness and sustainability (Freel, 1999) with minimal consideration towards the further growth of the enterprise (McMahon, 1998; Anderson et al, 2001; Clark et al, 2001; Gray, 2002). Such a conclusion will inform the debate regarding the strategic deployment of E-business usage within the SME community.

Thus, the likelihood of the success of E-Business within the individual enterprise was governed by key elements, including the knowledge and understanding of the technology by the Owner/Manager (Kendall et al, 2001), existing and relevant IT/IS skills and business culture, as noted by Van Beveren and Thomson (2002). SME Owner/Managers, especially the "Sole-Proprietor" micro-sized sector, seemed unwilling to accept risk and uncertainty within their business practices to any extent, thus giving rise to a lack of innovative E-Business usage and adoption. Only three of the case studies identified online trading capability and several presented evidence of stagnation, even regression, in their website deployment. Indeed, the enterprise website represented the most significant evidence of the Owner/Manager's attitude and understanding towards IT/IS in general through its appearance and content. If a website was neglected and underperforming, this suggested that Owner/Manager lacked knowledge and understanding of its capabilities and the IT/IS function was under-utilised. Such a mindset was likely to restrict the opportunity and potential of attaining higher business growth and place an artificial ceiling on further E-Business development, as suggested by Chappell and Feindt (2002) and Fillis and Wagner (2005).

Levels of E-Business planning within the SME sector

To understand E-Business usage within the SME sector, it was critical that the level of Owner/Manager strategic planning of the process be reflected upon. Beaver and Jennings (1996), Bridge and Peel (1999) DTI (2004), Kyobe (2004) and eCIC (2005) recognised the importance of effective strategic management and planning of all key enterprise processes, including E-Business as a precursor to successfully achieving business growth. Within the quantitative study, SME Owner/Managers were asked to identify the degree of E-Business planning undertaken. In the first instance, it was apparent that there was a lack of human resource maintaining the IT/IS function, with almost 20% of enterprises identifying no position of responsibility. This trend was mirrored within the "Sole-Proprietor" sector, where the Owner/Manager had sole responsibility in 84% of cases, although 16% of enterprises of this type allocated no management of this important operational function. The Owner/Manager having responsibility for the IT/IS function within this micro-sized classification, was to be expected given the nature and size of such enterprises. However, the ability of the Owner/Manager to undertake this role successfully was questionable, given the multitude of other managerial and operational responsibilities in addition to the impact of existing expertise, understanding and knowledge of IT/IS.

When asked whether E-Business had been integrated within business planning, 31% of the survey respondents responded. Of these, only 46% identified positively, a trend again mirrored within the "Sole-Proprietor" micro-sized sector with 40%. Thus, when the whole survey population was considered (n=500) only 14% identified undertaking any form of strategic planning of the E-business function. When contrasted by industry, the Communications/Computing sector revealed high levels of planning in contrast to the Manufacturing, Retail/Repair, Wholesaler, Finance/Insurance/Real Estate/Legal Services/Transport and Construction sectors. This evidence suggested that the strategic planning of the E-Business function was more prevalent within industries, which

were traditionally more technology intensive which confirmed the findings of prior surveys (e,g, DTI 2000-2004). Analysis of usage of E-Business by LA revealed minimal significant trends although deployment was typically higher in non-Objective One areas which was probably due to the high proportion of micro sized enterprises surveyed within each authority.

Within the micro-sized SME case studies, which represented enterprises with an established E-business presence, half of the respondents identified no formal strategic planning of the E-Business function being undertaken. Within such enterprises, the evidence indicated an informal and ad hoc planning process, driven by day-to-day operational needs and Owner/Managers' perceptions. Five case studies identified a formal planning process being undertaken, although the empirical evidence supporting the claim was limited, suggesting the process lacked structure, formality and validity. This evidence supported the findings of the quantitative study, suggesting a lack of effective planning being undertaken and a naivety and ignorance regarding the value of this process.

In summary, evidence from the survey and case study sources suggested a lack of dedicated E-Business planning within the SME sector, particularly within the "Sole-Proprietor" micro-sized enterprises. Previously, Storey (1994), Chan et al, (1997) and Raymond et al, (2005) stressed the importance of business planning as a contributing factor towards growth and increased organisational profitability, which was supported in an IT/IS context by Blili and Raymond (1993). The evidence presented within this section concurred with the literature, which recognised that SMEs were deficient in E-Business planning which can be associated with the lack of knowledge and understanding of the technology (Section 7.2.1) (Cragg and King, 1993; Hagmann and McCahon, 1993; Ballentine et al, 1998; Fink, 1998; Bridge and Peel, 1999; Quayle, 2002; Paper et al, 2003; DTI, 2004; eCIC, 2005), with most investing in IT/IS incrementally. The inability of SMEs'

Owner/Managers, particularly the "Sole-Proprietor" micro-sized sector, to manage E-business strategically was a significant liability, which affected their capacity to deploy such technologies effectively, beyond a day-to-day operational basis.

In summary, this research question has enabled the thesis to clarify the key factors affecting SME E-Business usage. The primary research confirmed the central importance of the Owner/Manager as the key enabler of E-Business within the individual enterprise. The lack of strategic management, evaluation, knowledge and understanding of E-Business technologies by Owner/Managers, has resulted in limited investment and poor implementation and development across the SME sector. The research has highlighted the significance of inhibitors, drivers, perceptions and strategic planning frameworks to successful E-Business usage and further deployment. Having identified the key elements influencing E-Business usage and adoption, it was then possible to consider the second research aim within this study. This research aim evaluated and contrasted the usage of E-Business within micro-sized "Sole-Proprietor" SMEs against other size classifications, to identify key variances in behaviour and practices.

7.2.2 Research Aim Two: Evaluate and contrast E-Business usage in micro-sized "Sole-Proprietor" SMEs against other size classifications

Section 3.6 of the literature review, suggested that successful deployment and adoption of E-Business was more prevalent in larger organisations (Van Beveren and Thomson, 2002) than within the SME community (Sadowski et al, 2002; Beckinsale and Levy, 2004; Chong, 2004; DTI, 2004). The primary evidence collated within this thesis agreed with this viewpoint. Indeed the findings suggested that there was a significant variance of implementation between the larger SME sized classifications ("10-49" and "50-249") and the micro-sized groupings ("Sole-Proprietor" and "1-9" groupings) (Table 39). Table 39 provided a comparative measure of SME E-business performance in three

significant technologies namely Internet access, E-mail and website access. Usage of these technologies was contrasted by producing a mean of uptake from all prior surveys identified in Table 12 Section 3.9, dating from the year 2000. This average was contrasted against the overall results obtained from the survey for each technology and the sub-categories for each SME size classification ("50-249", "10-49", "1-9" and "Sole-Proprietor").

Table 39: Adoption of E-business Technology by SME Size classification

Technology	Prior Survey Average %	Quantitative Survey %	50-249 %	10-49 %	1-9 %	SP %
Internet Access	76.9	57.2	91.7	86.1	58.1	36.5
External E-mail	78.0	47.6	91.7	73.6	44.6	31.2
Website	56.9	32.6	88.9	44.4	31.5	17.1

Table 39 identified that the results of the survey produced lower levels of uptake in contrast to the prior reports in each of the identified technologies. As noted in Section 7.1.1, this was undoubtedly due to the realistic nature of the survey population with a representative proportion of micro-sized enterprises included. Table 39 identified a consistent picture of diminishing uptake within the micro-sized enterprises, in comparison to larger sized SME classifications. The importance of enterprise size to effective E-Business deployment was reinforced by a series of positive chi-square association tests. A significant association was identified between SME size classification and Internet access (Appendix H – Table One). Another positive chi-square association was identified between SME size classification and E-mail uptake (Appendix H - Table Two). Finally, a positive association was identified between

SME size classification and website ownership (Appendix H - Table Three). Therefore, the statistical evidence indicated that enterprise size was a significant determinant in successful E-Business deployment. This can be explained by the greater financial and human resources available in the larger SME classifications to manage and resource the E-business function.

These trends continued in terms of usage of E-Business technologies for business related activities. The larger SME sized classifications "50-249" and "10-49" identified higher levels of utilisation than the micro-sized ("Sole-Proprietor" and "1-9") groupings (Table 25, Section 5.1.3) in facets such as: -

- finding information
- advertising purposes
- purchasing
- sales.

This pattern was replicated in website deployment (Table 28, Section 5.1.4) for: -

- advertising and marketing to customers
- distributing information to suppliers
- distributing information to employees
- generating enquiries and online sales.

Investment in E-business technology such as websites was appreciably higher in the larger sized SME classifications (Table 30). A significant chi-square association was identified between SME size classification and website income. This result suggested that SME size was a significant factor in the generation of income from E-Business activity. There was further evidence of good practice where individual larger and micro-sized SMEs, had achieved a notable increase in their business

income through their online website trading activities. This suggested a lack of consistency across the SME sector in successful deployment of E-Business technologies, whereby the usage was not utilised to its maximum potential. When the Owner/Manager attitudes towards E-Business usage were considered in terms of drivers (Table 32) there was less significance in the trends between the different enterprise size groupings. The most significant drivers to usage across all SME size categories were: -

- to create a new marketing media
- improve communication of information
- access new markets
- keep up with competitors.

A similar picture emerged with the inhibitors to E-Business usage. In all SME sized classifications, the most significant inhibitors were identified as time to develop and maintain an E-Business operation and lack of relevant skills. It was apparent that the level of concern regarding the impact of inhibitors to E-Business was less significant in the larger sized SME groupings. The Owner/Managers of the SME micro-sized grouping shared similar concerns, although these were more prevalent than within the larger SME classifications. Owner/Managers of micro-sized SMEs were most concerned with the time to develop and maintain an E-business operation, lack of IT/IS skills, low use by customers and suppliers and insufficient financial resources.

In larger sized SME classifications, these issues were still relevant but were awarded less significance by Owner/Managers. These findings agreed with the studies of Clark (1987), Heikkila et al, (1991) and Pollard and Hayne (1998) who noted the prevalence of limited financial resources within SMEs to invest in IT/IS. A positive chi-square association was identified between the inhibitor lack of information, advice and support and SME size classification. Thus there was an

apparent belief amongst the Owner/Manager community that larger SME size classifications received better E-Business advice and support than their smaller sized counterparts.

In conclusion it was apparent that larger sized ("50-249" and "10-49") SME classifications were utilising E-Business technologies more effectively than micro-sized enterprises ("Sole-Proprietor" and "1-9"). This finding contradicted the opinions of both Sterrett and Shah (1998) and Stockdale and Standing (2004) who argued that micro-sized enterprises could compete with larger-sized enterprises through E-Business. The statistical evidence suggested otherwise, with a definite association between SME size classification and deployment of significant E-Business technologies. This suggested the necessity for improved management and deployment of the E-Business function within micro-sized SMEs.

Previously, Pollard and Payne (1998) and Fillis et al, (2003) suggested the need for alternative managerial approaches within micro-sized SME to successfully exploit E-Business. The prior research aim 7.2.1 stressed the significance of the Owner/Manager in driving the usage of E-Business, which was reinforced by the evidence presented here. Micro-sized SMEs' deployment of E-Business could only attain parity with the larger SMEs by a process of ongoing and strategic implementation. This process could be encouraged by ensuring that SME Owner/Managers were aware of the opportunities that E-business offered. Such a role should be undertaken by enterprise support agencies in conjunction with other significant bodies.

7.2.3 Research Aim Three: Development of an E-Business environment conceptual model for "Sole-Proprietor" micro-sized SMEs

This section proposed a framework to represent the nature and reality of E-Business usage within the "Sole-Proprietor" SME sector, based on the

findings of this thesis. Section 3.11 Figure 14 proposed a conceptualisation of SME E-Business usage based on a detailed review of extant literature. The following sections provided the debate to refine and improved this conceptualisation in the context of the micro-sized "Sole-Proprietor" SME sector, based on the findings of the primary research, including evidence drawn from the first two research questions (Section 7.2.1-7.2.2). It was apparent from the investigation of E-Business usage that "Sole-Proprietor" SME Owner/Managers were subject to a plurality of influences that were both internal and external to the enterprise. Each of these groupings was now considered in turn.

External determinants: public sector

It was apparent that the Public sector was a significant influence upon E-Business usage in several ways. For example, the attitude of the EU, UK, WAG and regional government could be a significant determinant of E-Business adoption. As recounted in Section 2.3, all governmental levels including EU, UK and WAG, have developed policies to encourage SME E-Business activity, as it was in their interests to increase business productivity, efficiency and sustainability. This activity was subsequently benchmarked within a UK and regional context by academic, public and private sector reports, including the DTI (2000-2004), FSB (2002-2004) and eCIC (2003-2005). Such reports provided case studies of best practice for SMEs. In addition, they provided an indication of national deployment levels in the significant E-Business technologies, which potentially informed and drove further utilisation. Thus, there was obviously a close association and synergy between government policy and activity within trade associations such as BERR and the FSB. The key function of BERR (formerly the DTI) was to operationalise government policy, increase productivity, create the conditions for business success and strengthen economic performance of all UK regions (BERR, 2008).

Within Wales, several enterprise support agencies were created by the WAG to assist with generic enterprise start-up (e.g. Business Eye), whilst others focused on specific development activities including E-business growth (e.g. Opportunity Wales). For example, the Opportunity Wales agency claims to have assisted approximately 12,000 enterprises within Wales since 2001 (Opportunity Wales, 2008). Opportunity Wales operates as a partnership, backed by a number of public, private, voluntary and charitable sector organisations. This equated to approximately 8.3% of the current total SME population in Wales (Table 4) representing a considerable achievement. However, further independent research is required to verify such claims and assess whether E-Business utilisation has evolved significantly in these enterprises and the contribution made to economic growth as a consequence. These claims were supported to an extent by the evidence from the primary research. For example, six per cent of enterprises within the quantitative survey with a website identified making use of an enterprise support agency to develop their website presence. Furthermore, Enterprise E within the case studies identified making use of Opportunity Wales to develop their website. Therefore, it was apparent that enterprises support agencies had impacted significantly upon the level of E-Business within the SME sector and were therefore included within a conceptualisation of the environment.

Similarly, academia has played a significant role in the encouragement and monitoring of E-Business within Welsh SMEs. For example, a number of Welsh Universities have been heavily involved in the encouragement of E-Business activity within Welsh SMEs. The Opportunity Wales project, has involvement from both Cardiff University and the University of Glamorgan (Opportunity Wales, 2008). In addition, several Universities in Wales are involved in the monitoring of E-Business performance, including the University of Glamorgan and Cardiff University. The University of Glamorgan is coordinating this years' FSB bi-annual survey, within which, E-business performance is

measured. Furthermore, Cardiff University has produced the (eCIC 2003-2005) surveys from the eCommerce Innovation Centre.

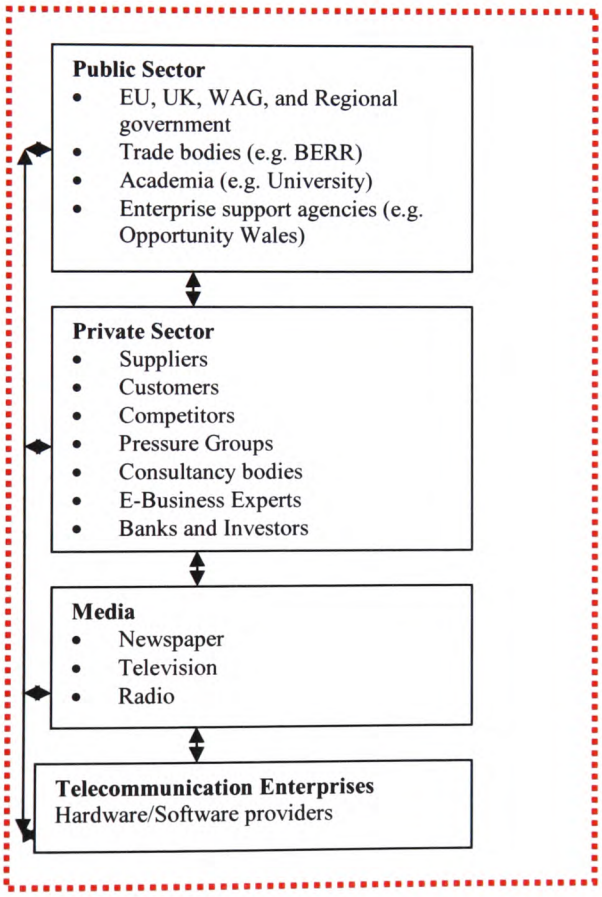
Thus, it can be seen that the contribution of academia to E-Business deployment within Wales is significant. A significant problem with academic involvement in E-Business deployment was that such activity was typically funded by short-term European grant monies. On completion of a project, the activity was discontinued. Such an occurrence can only inhibit the potential impact of such a project leading to short-term strategies thus limiting long-term benefit to the Welsh economy and E-Business activity and utilisation. A recent example of this was the dissolution of the eCIC centre within Cardiff University, due to the cessation of project funding. Academic involvement in E-Business activity would be of increased value, if WAG took a longer-term strategic approach to co-ordinated co-operation between the sector, enterprise support agencies and the private sector. Figure 28 illustrates the role of these bodies diagrammatically.

External determinants: private sector

The private sector was identified as another external grouping that impacted upon the level of E-Business deployment within the SME sector. Without question, suppliers, customers, pressure groups, consultancy bodies, E-Business experts, hardware/software providers and banks/investors, all impact upon the levels of utilisation within the SME micro-sized "Sole-Proprietor" SME sector (Riemenschneider et al, 2002). Poon (2000) noted successful SME E-Business utilisation should demonstrate awareness of the business environment, including relationships with suppliers, customers and competitors to attain success. Relationships between enterprises customers and suppliers have altered due to the influence of improved E-Business communication, which, has in turn impacted upon value chains (Tumolo, 2001; Piris et al, 2004). The linking of enterprise value chains has created value systems, as identified by Porter and Millar, (1985) enabling the deployment of

technologies such as extranets and electronic payment facilities thus enhancing business communications and efficiency. Indeed several studies have stressed the opportunities provided by the Internet in removing geographical constraints and enabling enterprises to compete in potentially global markets for both suppliers and customers (Anckar, 2003; Dholakia and Kshetri, 2004).

Figure 28: External Determinants to E-Business usage in "Sole Proprietor" SMEs



Conversely, limited Internet usage by customers and suppliers could negatively impact upon business and trading relationships and operational efficiency, a symptom which was also evident within the survey and case study findings (Sillence et al, 1998; Hadjimanolis, 1999). Furthermore, external pressure, exerted by customers and suppliers

(Keeling et al, 2000; Poon 2000; Beckinsale and Levy, 2004) could force an enterprise into adopting E-Business technologies against its wishes. The prior evidence identified low levels of integrated E-Business technology with customers, suppliers and partners, especially within the micro-sized SMEs classifications (Potter and Pickernell, 2004). The quantitative survey indicated a limited relationship based on the communication of information with customers and suppliers for enterprises with a website. These statistics were significantly inferior within micro-sized enterprises (Table 25 and 28). Customers demanding connection to enterprise services, competing with competitors and suppliers requiring connection, were perceived as drivers to E-business deployment. Within the case studies, E-mail was used for communicating with suppliers and customers and for receiving customer and supplier queries and enquiries. In addition, the website was perceived as a method of improving the linkages with customers and suppliers through regularly updated information.

The influence of pressure groups was also identified within the prior literature, a significant example being the FSB. The FSB represented a non-profit making, private sector trade association. The FSB acted as a pressure group to promote and protect the interests of the self employed and small enterprise members, to positively influence governmental and media groups (FSB, 2008). The FSB benchmarked the behaviour of its membership, by undertaking a bi-annual survey. These reports were produced by academia which reinforced the strong relationship between the Higher Education sector and trade associations. The results of these surveys (FSB 2002-2006) were analysed within Section 3.8.5.

Consultants and E-Business experts represented further groups, which potentially influenced the uptake of E-Business within the SME. The potential existed for SME Owner/Managers to seek E-Business consultants e.g. to develop their enterprise website. This was apparent within the primary research, whereby 41% of respondents within the quantitative survey, and three of the case studies, identified that their

websites had been developed by a dedicated web design enterprise. Similarly, E-Business experts had produced a large number of publications related to E-Business within the SME, which an Owner/Manager could have used as a reference source, to assist the development of technology within their enterprise.

Banks and investors represented another potential external influence on the use of E-Business within an enterprise. The literature has identified limited finance as a key reason for SME failure (Binks and Ennew, 1996; Owens and Beynon-Davies, 2001b; Lewis and Cockrill, 2002; Potter and Pickernell, 2004; WAG, 2004; Wymer and Regan, 2005). The inability of the Owner/Manager to raise the appropriate level of capital, might potentially affect its ability to invest in and exploit E-Business (Daniel, 2003). This was confirmed within both the quantitative survey and case studies, whereby insufficient financial resources were perceived as significant inhibitors to the further utilisation of E-Business.

The role of the media and its influence on SME Owner/Managers cannot be underestimated. Within Wales the national newspaper, "The Western Mail", regularly featured articles regarding the role of E-Business in the SME community (icWales, 2008). Such activity would only encourage the usage of E-Business within the SME community, although further research is required to verify this claim. Furthermore, there existed a wide diversity of information available on the Internet from influential and respected organisations such as the BBC, national newspapers (e.g. "The Times"), and specialist publications which could all potentially influence Owner/Manager decisions to utilise E-Business.

Finally, the major telecommunication and hardware/software providers have played a significant role in the ability of the Owner/Manager to adopt and utilise E-Business. The importance of broadband utilisation to Wales, in terms of economic benefit, was identified as £1,135,000 by 2015 (AMC, 2006). To facilitate this, the WAG (2008), launched the "Broadband Wales Programme", to ensure widespread provision of

broadband throughout Wales. However, a lack of broadband connectivity was identified as an inhibitor to E-Business usage in rural areas of Wales (Potter and Pickernell, 2004). The DTI (2004) ranked Wales 12th out of 12 in contrast to other UK regions. Broadband providers such as British Telecom and Virgin Media, must collaborate with the key public sector bodies, to ensure this picture was improved. The hardware/software manufacturers such as the Microsoft Corporation play a significant role in the diffusion of E-Business technologies to the SME sectors. Technologies such as CRM and ASP offer real potential benefits to the SME sector provided they are available, useable and affordable. All these key bodies are again identified diagrammatically within Figure 28. Figure 28 identifies the necessity for network links between the media, telecommunication groups and public and private sectors. The degree of effectiveness of such inter-relationships will impact on the ability of the SME Owner/Manager to effectively deploy E-Business technologies.

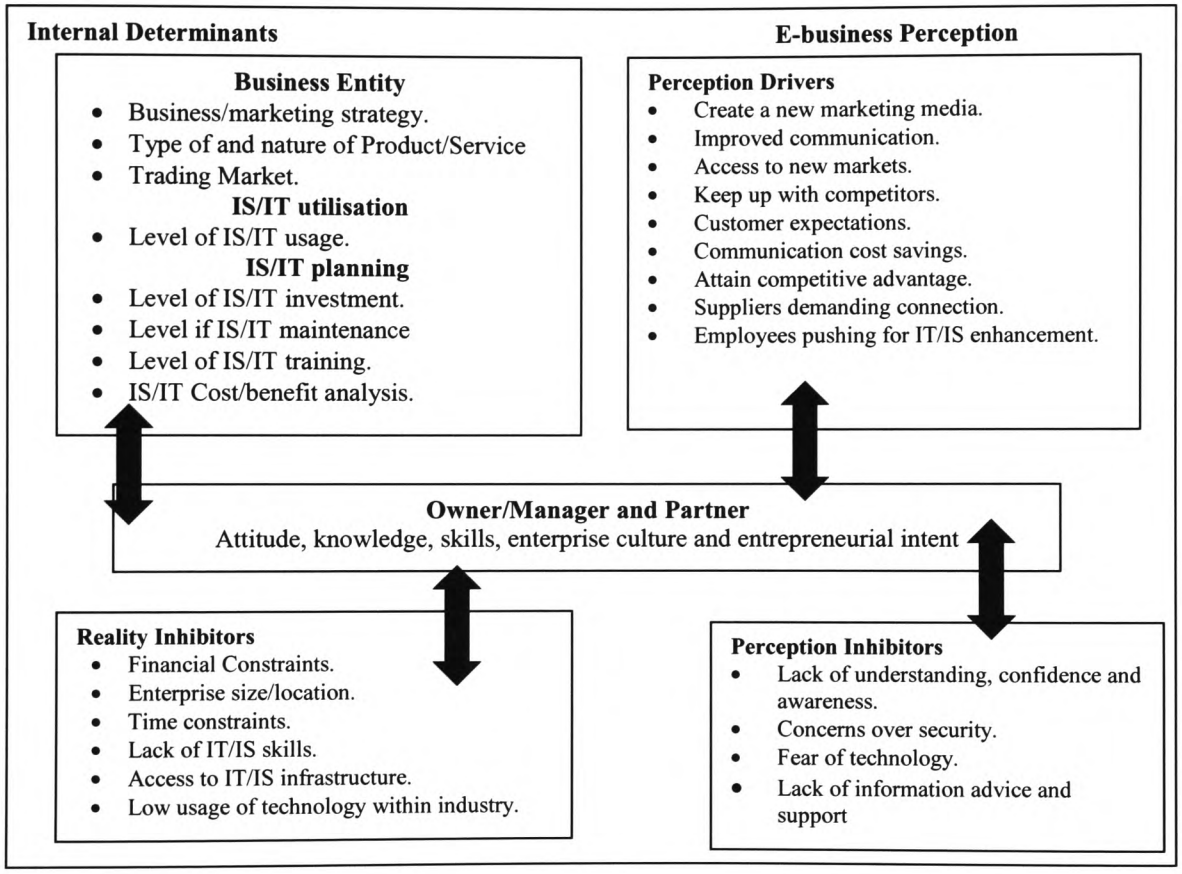
In summary, it was apparent from the literature and primary research, that the external environment has played a significant role in potentially influencing the Owner/Manager decision to utilise E-Business. Thus for the micro-sized "Sole-Proprietor" SME to successfully and effectively deploy and utilise E-Business the Owner/Manager must demonstrate an effective understanding of the external environment and its impact upon their business operations.

Internal determinants

Figure 29 represented a conceptualisation of the usage of E-business within the "Sole-Proprietor" enterprise. The model displayed the internal determinants which impacted upon the uptake and deployment of E-Business. Within the enterprise (Figure 29), a complex inter-relationship between variables was evident from the evidence presented in the previous chapters. The evidence that emerged from the case studies in particular revealed the central importance of the Owner/Manager to

effective E-Business adoption within "Sole-Proprietor" SMEs as confirmed by Jeffcoate et al, (2002) and Rodgers et al, (2002). The evidence from the case studies suggested that the Owner/Manager's decision to adopt E-Business, was determined by their perceptions and knowledge of E-Business.

Figure 29: Internal Determinants to E-Business usage in "Sole Proprietor" SMEs



It was apparent from the case study and survey findings that SME Owner/Managers were impacted by two forms of inhibitor, identified as reality and perception inhibitors in Figure 29. The more significant barriers to overcome, in terms of E-Business usage, were reality inhibitors, such as financial constraints, lack of IT/IS skills and time, which could severely impede an enterprise's technological development. Such inhibitors were recognised within the prior literature (section 3.3)

and were apparent within the survey (section 5.1.7) and case study research (section 6.5) reported within this thesis. Such issues could potentially create a ceiling on E-Business usage and further deployment or even deter any initial investment. Reality inhibitors were identified as more difficult to overcome than perception inhibitors by Owner/Managers within the case studies as they often involved factors outside their control such as access to affordable telecommunications infrastructure. Perception inhibitors were identified in Figure 29 as a lack of understanding, confidence and awareness, security concerns, technology fears and a lack of information, advice and support. These inhibitors were recognised within the prior literature (section 3.3) and present within the findings of the survey (section 5.1.7) and case study evidence (section 6.5). The evidence within the case studies suggested Owner/Managers that were concerned regarding such inhibitors were unlikely to commit meaningfully to E-Business investment.

Contrastingly, an informed Owner/Manager was often motivated to pursue higher levels of E-business deployment, due to improved understanding of the opportunities that enhanced technology adoption provided. The ability of the Owner/Manager to focus on the needs of the business, and adopt a more entrepreneurial attitude towards E-Business, might potentially offer a key to successful utilisation (Burns, 2006). Thus awareness of perception drivers (Figure 29) by Owner/Managers such as accessing new markets, achieving cost savings or utilising a new marketing media acted as a positive influence. The presence of E-Business drivers (Section 3.5) was again recognised within the previous literature, survey (Section 5.1.6) and case study (Section 6.4) evidence.

The applicability of E-Business to the business model of the enterprise was significant and potentially determined its likely impact on productivity and profitability. For example, the importance of E-Business to a trade based business, might be limited, to enhanced communication through E-mail and marketing through a website; in contrast to other enterprises whereby the business model could be

significantly enhanced and possibly remodelled through E-Commerce trading. Thus Figure 29 recognised the existence of the "business entity". This represented the individual enterprise and its levels of E-Business utilisation in addition to its existing business activities. Thereafter, the level of E-Business deployment was controlled by the Owner/Manager and their perceptions regarding its importance to the business model.

The first research question (Section 7.2.1) recognised the factors affecting E-Business usage within SMEs. The evidence confirmed the central importance of the Owner/Manager as the key enabler of E-Business within the enterprise. Furthermore, Section 7.2.1 highlighted the significance of inhibitors, drivers, perceptions and effective strategic management of the E-Business function, which were subsequently identified within Figure 29. Research question two (Section 7.2.2) identified that all SMEs experienced the impact of inhibitors to further development, but they were more prevalent within micro-sized enterprises especially within the "sole-proprietor" classified enterprises.

The negative influence of both perception inhibitors to E-Business could be reduced by providing the Owner/Manager with the requisite information and training to minimize the influence of negative perceptions (Matlay 2004). The case study research provided significant evidence of enterprises that had reached an optimum level of E-Business usage and deployment and were unable to progress further due to the impact of reality inhibitors such as limited finance for further investment. Thus it was apparent that the internal E-business environment was influenced by perceptions and knowledge of the Owner/Manager, the nature of the business operation and the current level of technology deployment.

When the internal and external environments are combined (Figure 30) it was apparent that the external environment impacted significantly upon the Owner/Manager and the internal environment. Effective E-business

deployment within the individual SME might be positively influenced by an effective and co-ordinated public sector provision within a particular region. The role of networking and peer pressure as an influence upon the usage of E-Business on the SME Owner/Manager cannot be underestimated as both a potentially positive and negative influence. The public sector bodies must assume a responsible role in ensuring that SME Owner/Managers are positively informed regarded the value that E-Business utilisation can provide to business operations.

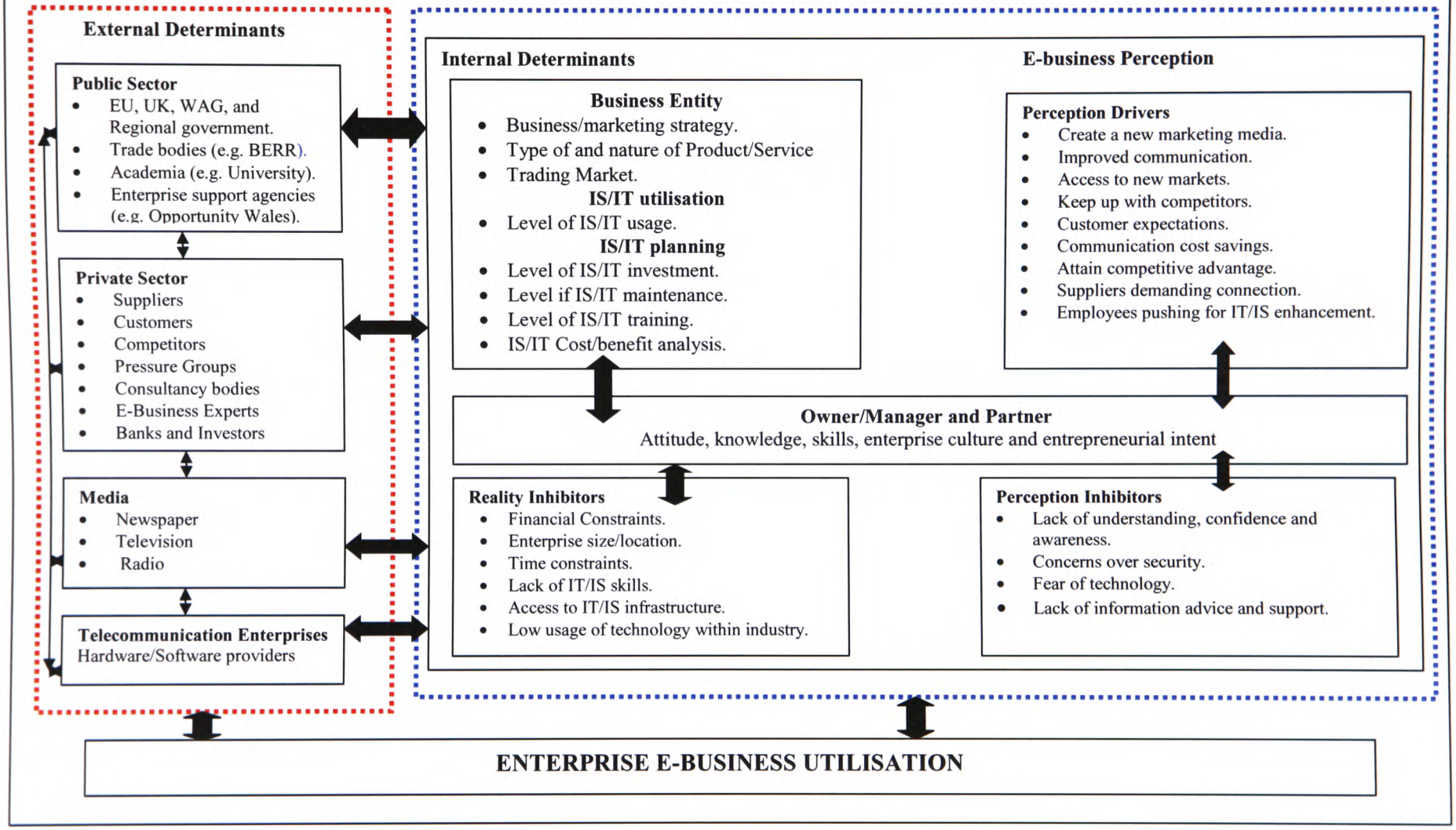
7.3 Conclusions

This chapter has presented a framework to represent the reality of E-Business usage. Figure 30 identified the central importance of the Owner/Manager of the "Sole-Proprietor" SME in the usage of E-Business and the influence of both external and internal determinants. It was apparent that there was a lack of strategic management of the E-business function and inadequate evaluation of the effectiveness of its impact. The case studies in particular, provided evidence that suggested SME Owner/Managers' usage of E-Business was operationally, as opposed to strategically, focussed. Such behaviour was represented by the Owner/Manager adopting a short-term reactive perspective to E-Business usage within the enterprise. IT/IS purchase decisions were made on a short-term ad hoc basis, with a view to meeting an immediate operational requirement.

Investment in E-Business was expected to make an immediate contribution to operational effectiveness of the enterprise. If an E-Business investment did not provide an immediate return in investment, it was given less priority, or even discontinued after a period of usage. The case studies provided further evidence of a lack of evaluation on the impact E-Business had made on enterprise efficiency. Thus, the basis for E-Business deployment was typically focused on ensuring operational sustainability of the enterprise, via reactive short-term decisions as

opposed to the pursuit of competitive advantage as mooted previously by Levy et al (1997).

Figure 30: A Conceptualisation of the key actors and relationships influencing E-Business usage and adoption within the SME "Owner only" sector



When the nature of typical E-Business adoption was considered within the individual enterprise, clear parallels could be drawn from well-known diffusion models, including Rogers (1983) and Davis (1989) frameworks (Section 3.1). Key adoption factors affecting the SME Owner/Manager included the issues of user acceptance, adoption and the nature of how the technology was diffused within the enterprise. It was apparent that SME Owner/Managers made utilisation decisions, which bore relevance to Rogers Diffusion of Innovation Model.

There within SME Owner/Managers would only consider adopting a new technology, if it offered a relative advantage over a preceding technology. This issue had to be completely transparent to the Owner/Manager. For example, a website was perceived as a worthwhile investment, as it offered the potential of exploiting new markets and generating additional income. Any new technologies would have to be compatible with existing enterprise systems and be relatively easy to implement. Issues of trialibility and observability were seemingly less significant within the SME "Sole-proprietor" community. As previously outlined, any E-Business developments were expected to provide immediate operational benefit and make an instant contribution to the enterprise profitability or efficiency.

The nature of adoption was similar to that proposed by Rogers model, with SMEs' adoption of the technology being represented by innovators, early adopters, the early majority, the late majority and finally laggards. In terms of the SME "Sole-Proprietor" micro-sized community, the usage of website, E-mail and the Internet, were still far from typical and sophisticated technologies such as CRM, extremely rare. Thus, the majority of "Sole-Proprietor" micro-sized enterprises were typically in the early stages of adoption and were yet to achieve any significant benefits from usage. Similar associations could be made with Davis (1989) TAM within (Section 3.1) which the two central tenets were perceived usefulness and ease of use. Figure 31 revisited and reconstructed the original TAM from the perspective of the micro-sized

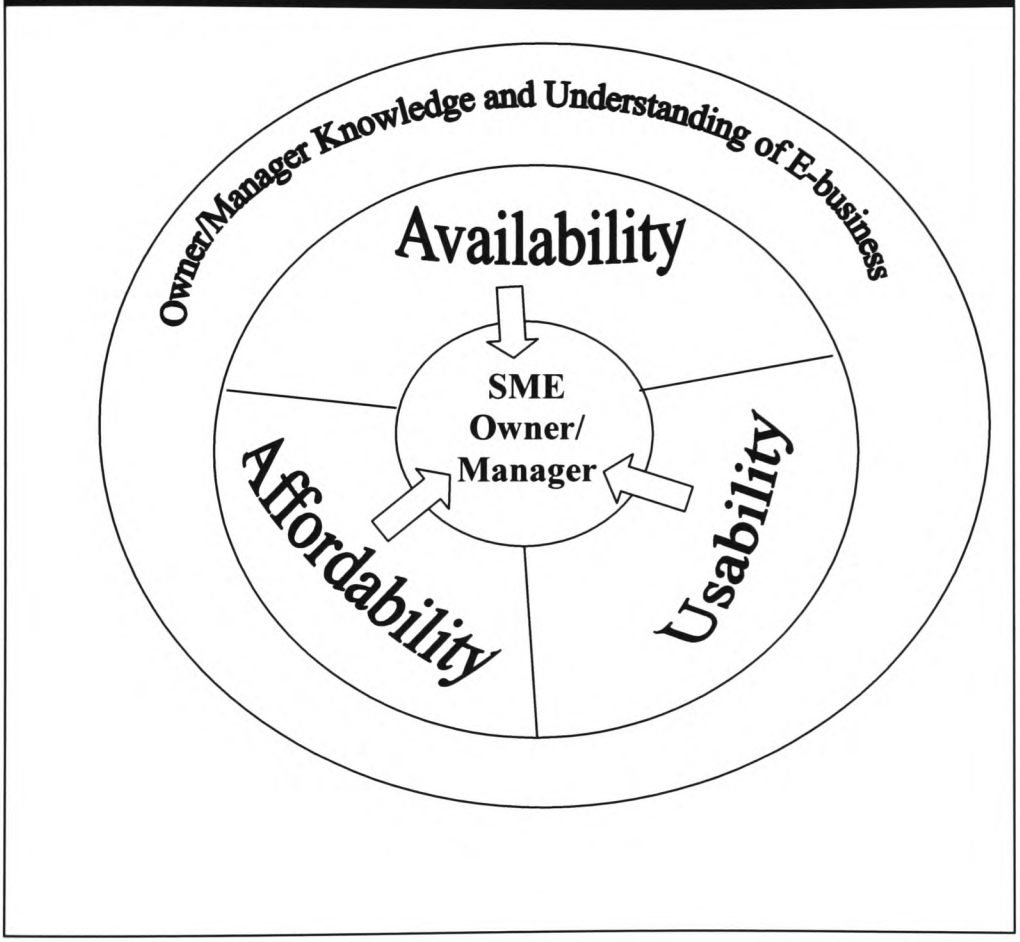
"Sole-proprietor" SME Owner/Manager usage of E-Business. The primary research indicated that the central issues, in terms of E-Business adoption with the Owner/Manager of the "Sole-Proprietor", were concerned with the availability, usability and affordability of each potential technology. Availability was concerned with the access to the technology in question. For example, usage of the Internet, E-mail and website had to be available to the SME for the Owner/Manager to consider adoption. Determinants of this variable would be access to broadband infrastructure and the ability to purchase the requisite hardware.

As previously discussed, broadband infrastructure in Wales had greatly improved in recent years, alongside the increased availability of IT/IS, which has driven the increased uptake of E-Business related technologies (eCIC, 2005). Affordability represented the cost of implementing the individual technology to the SME. This variable was determined largely by the external business environment identified in Figure 29, with particular reference to the hardware/software providers. This grouping drove the adoption of both hardware and software. Examples to illustrate this facet would be the widespread adoption of the PC within the SME community, due to its increased affordability (Pollard and Hayne, 1998). Conversely, an example of a technology which has not as yet become widely accepted within the SME community, due to excessive cost (£10,000 plus), would be CRM (Bharati and Chaudury, 2006), given the financial constraints (NOP, 2000; Owens and Beynon-Davies, 2001a; Lewis and Cockrill, 2002; DTI, 2004; Potter and Pickernell, 2004; eCIC, 2005; Wymer and Regan, 2005) prevalent within the majority of SMEs, especially the "Sole-Proprietor" micro-sized classifications.

The final facet of Figure 31 examined usability of E-Business technology. Usability considered how effectively the SME could imbed and utilise the individual technology within the enterprise, without incurring significant additional costs for training, maintenance and ongoing usage. It was apparent from the primary research, that

Owner/Managers of micro-sized "Sole-Proprietor" SMEs, would only consider adoption and on going usage if they were convinced of the immediate added value that occurred from deployment. Perceived additional costs that would occur from adoption and utilisation were seen as a significant inhibitor to adoption and utilisation, in both the survey and case study (Section 6.5 and Section 5.1.7) population.

Figure 31: Key influences on the Owner/Manager in the usage and adoption of E-Business



The E-Business literature stressed that SMEs suffered from limited IT/IS knowledge and skills and training provision (Anckar and Walden, 2001; Barry and Milner, 2002; Kyobe 2004). The lack of IT/IS knowledge of the Owner/Manager could have a significant impact on the perceptions regarding new E-Business technology and potentially deter uptake, due to the fears regarding the implications of utilisation. Figure 30 had

reinforced the central importance of the Owner/Manager as the fulcrum responsible for the adoption and utilisation of E-Business within the SME "Sole-Proprietor" micro-sized enterprise. Figure 28 and 29 identified the key external and internal variables driving and inhibiting E-Business usage within the micro-sized SME community.

7.4 Implications of Research for Key Bodies

This research has significance for a number of organisations, including the SME community with specific reference to the "Sole-Proprietor" community, governmental decision makers (namely, the WAG in the context of Wales), the academic community, media, trade organisations and private sector generally. The determinants of the E-Business usage presented within Figure 28 and 29, highlighted the inter-relationship of the external and internal determinants of E-Business usage. If E-Business usage in the SME community was to progress beyond existing levels, then the determinant bodies identified in Figure 30 must collaborate effectively at a strategic level and act as a collective for the benefit of the economy. The following section considered the implications for all the above-named bodies within the context of Wales.

Within Wales and the rest of the UK, the primary and manufacturing sectors have continued to struggle, a recent example being the closure of the Alcoa aluminium plant in Swansea, with the loss of 300 jobs (Turner, 2006). To ensure ongoing growth and prosperity of the Welsh economy, it was essential that the SME community, especially the "Sole-Proprietor" grouping, remained the central focus of the WAG and encouraged the effective usage of E-Business to improve individual business sustainability, efficiency and performance. Consideration must be given to encouraging new enterprise start-up and maintaining the existing business population, due to high failure rate. The nascent entrepreneurial population, most importantly the student and school leaver community, must be encouraged by a supportive legislature, enterprise support networks, trade organisations and business culture, to

consider an entrepreneurial career and business start-up as a viable and prosperous career route. Effective E-Business adoption must be considered as a key underpinning strategy to achieving immediate operational sustainability, increased efficiency and productivity and, thereafter, pursuing a viable growth strategy. Therefore, it remained critical that key organisations, which could influence the effectiveness of the business start-up process, ensure that the potential entrepreneurial population was aware of the opportunities offered by the effective deployment of E-Business.

7.5 Contribution to Knowledge

This section stated the contribution made to the knowledge area of E-Business usage in the SME sector within a regional context through the research undertaken in this thesis.

Firstly, this study provided a unique insight, through a mixed method study into the usage of E-Business in the context of the micro-sized "Sole-Proprietor" SME sector. This has made a valid contribution to the improved understanding and awareness of E-Business in this field, where there was an acknowledged gap in the literature especially in the context of micro-sized SMEs (Raymond, 2001; Craighead and Laforge, 2003; Downie, 2003; Jones and Mohon, 2005; Fink and Disterer 2006). A series of statistically significant chi-squared tests and other evidence revealed that larger-sized SMEs were more effectively deploying E-Business than their micro-sized counterparts were. Furthermore, the evaluation of the "Sole-Proprietor" micro-sized SMEs represented a unique perspective of this statistically significant member of the SME community.

Secondly, the study presented a E-Business framework (Figure 30) to represent the "Sole-Proprietor" SME micro-sized sector. The framework recognised the central importance of the Owner/Manager, the influence of the external and internal environment and their inter-relationship on E-

Business usage. The model recognised that the usage of E-Business was heavily influenced by the Owner/Managers' ability to strategically plan and evaluate the impact of the adopted technologies upon business processes. The thesis acknowledged that inhibitors to E-Business occurred as initial and ongoing influences and were defined as perception or reality barriers. The thesis identified statistical evidence for the existence of inhibitors in all SMEs size classifications although these were more prevalent within the micro-sized groupings. Within the framework (Figure 30), the adoption and usage of E-Business was influenced by positive drivers and negative inhibitors that potentially impacted upon the effective deployment of technology. The context of the SME size classification was significant and differentiated frameworks were required to represent the reality of E-Business utilisation within each grouping.

Finally, this thesis recognised the significance of adequate knowledge, positive perceptions and understanding of the Owner/Manager within the micro-sized enterprise, as critical to the effective usage and deployment of E-Business. Such knowledge informed the proposition posed within this thesis namely to examine whether SME Owner/Manager utilised E-Business technologies to achieve business growth. It was apparent from the case study evidence that the adoption and utilisation decisions regarding E-Business were typically implemented with a view to achieving immediate short-term benefit and maintaining enterprise sustainability, as opposed to long-term profitability and potentially changing the nature of the business model. Thus it was apparent that Owner/Managers in "Sole-Proprietor" micro-sized SMEs typically adopted E-Business to enhance immediate enterprise profitability and efficiency.

There was no evidence of "Sole-Proprietor" Owner/Managers adopting E-Business as part of a business growth strategy. Indeed there was minimal evidence of a planned and managed E-Business strategy within any of the evaluated case studies. Such a short term utilisation strategy

meant that the undoubted potential of E-Business was not maximised. The study drew comparisons with Davis (1989) TAM adoption model, in that, the usage and adoption of sophisticated levels of E-Business would only occur if the technology become widely available, was usable and affordable, and its deployment resulted in immediately attainable benefits to the enterprise.

As identified within the previous section, to enable the further take-up of E-Business within the SME "Sole-Proprietor" sector, it remained critical that key public and private sector bodies such as WAG and academia, encouraged long-term adoption and utilisation by enhancing Owner/Manager SME knowledge, attitude and skills.

7.6 Limitations of Research

This section recognised the limitations of the thesis and identified potential improvements. These issued were examined throughout the Methodology Chapter and hereafter summarised. It was recognised that it was difficult to generalise the findings of this thesis, as both quantitative and qualitative studies were undertaken within a regional context to assess their applicability. Therefore, the key findings proposed within this chapter would require further testing within other UK regional contexts. Furthermore, there would be great value in assessing the framework proposed within Figure 30 within different SME size classifications and IA classifications. For example, this study focused predominantly on the "Sole-Proprietor" micro-sized sector and the necessity to examine impact of E-Business through qualitative evidence on other SME size classifications. In addition, it was apparent that the longitudinal period of 18 months for the case studies, could be extended to identify long-term usage and adoption trends, in terms of impact upon the enterprise and ongoing attitudes of the Owner/Manager.

The survey recognised the limitations of survey data in measuring an individual enterprise's usage of E-Business. As identified previously, the

data had value in measuring utilisation trends of certain E-Business technologies within particular regions, although the analysis of the "Sole-Proprietor" micro-sized sector would have been improved by a greater representation within the overall survey population. Furthermore, it remained vitally important that further representative quantitative surveys were undertaken to measure the ongoing trends of E-Business within Wales and the rest of UK. Such data enabled baseline comparisons to be undertaken regarding the effectiveness of the SME community in utilising E-Business.

The in-depth case studies of E-Business utilisation were focused upon existing and traditional industry activity. The proposed framework would be improved by investigation of new business start-ups with an online only specific business usage model. In addition, the model construction would be further informed by focus on specific industry sectors. Furthermore, additional research should be undertaken, to assess the acquisition and effectiveness of advanced technologies, such as CRM within "Sole-Proprietor" type businesses.

7.7 Future Research and Opportunities

The findings of this research will be reported within peer-reviewed journals on the completion of this study. In addition, further research will be undertaken into the exploitation of E-Business within the SME sector. This will involve a series of more focused studies to examine the adoption patterns of E-Business within specific industry groupings and SME classifications. The author intends to liaise and network with other members of the academic community, to develop further research opportunities through comparative studies investigating national adoption patterns. Such activity will develop and enhance the body of knowledge and provide further evidence regarding the reality of E-Business usage.

More generally, within the discipline, there was a necessity for improved and ongoing relationships between the academia and the SME

community in order to fully understand the issues therein. The author would recommend the need for ongoing and further quantitative and qualitative investigation within the context of Wales, to enable the key bodies to remain informed regarding E-Business utilisation levels and the effectiveness of its deployment. The author would urge academia to produce in-depth qualitative studies with a longitudinal focus, illustrating the benefits that advanced E-Business usage and adoption would produce upon the SME. Where quantitative studies are undertaken, these should focus upon the same enterprises to monitor actual growth patterns within individual enterprises.

The author would also recommend that there was a need to examine adoption trajectories within a range of SME size and industry classifications. As identified previously, there is a need to realistically understand and portray the specific development paths that occurred within specific industries and SME size classifications. Further research could be undertaken, investigating whether variables such as gender, age and ethnicity of the Owner/Manager, influence E-Business usage and adoption. Such data will further inform the usage picture of E-Business and provide a further contribution to the known literature. All key bodies involved within the usage of E-Business must network and co-ordinate their actions effectively, if sophisticated usage of E-Business usage within the SME community is to be enhanced.

Appendices

Appendix A Part 1: Covering Letter for Quantitative Survey

Title Initials Surname
Institution
Address 1
Address 2
Town City
County
Post Code

31 Sketty Avenue
Sketty
Swansea
SA2 0TE

Dear Sir/Madam

I am researcher at the University of Glamorgan Business School, investigating the role of Information Technology (IT) and use of the Internet within Small and Medium sized enterprises within Wales.

I would be most grateful if you could aid my research by completing the enclosed questionnaire and returning it within the stamp addressed envelope provided, as soon as possibly convenient. Please complete and return the first part of the questionnaire even if your enterprise does not have an IT function as this information is just as valuable to my research.

The information within the questionnaire will be treated as strictly confidential and your anonymity and your organisation protected. This research will only be used for the purposes of this research. If you express interest in the questionnaire you will be sent a full copy of the results.

Thank you for you co-operation in this matter.

Yours faithfully

Paul Jones

Appendix A Part 2: Letter to Case Study Participants

business school
University of Glamorgan

Title Initials Surname

Institution
Address 1
Address 2
Town City
County
Post Code

31 Sketty Avenue
Sketty
Swansea
SA2 0TE

Dear Sir/Madam

I am senior lecturer and researcher at the University of Glamorgan Business School, investigating the use of E-Business (including personal computers, E-mail, websites etc) within small and medium sized enterprises within Wales.

I would be extremely grateful if you could aid my research by allowing me to interview you to relate your experiences of this technology and how it has impacted upon your enterprise. The interview should take no longer than an hour and will be arranged at a time and location of your choice. Please note that I am not trying to sell you anything or encouraging your participation in any public sector project or scheme. Please be assured that any information you provide will only be used for the purposes of my research. The information that you provide will be treated as strictly confidential and your anonymity and your organisations protected. To ensure accuracy of our discussion I will record it, with your permission and you will be provided with a script to ensure you are satisfied with the accuracy of the information.

I will be evaluating the experience and growth of E-Business within a range of SMEs and would welcome the opportunity to share my results with participating enterprises. Therefore if you express interest in the study I would welcome the opportunity to send a full copy of the results.

I will contact you shortly via E-mail or telephone to ascertain your willingness to participate within this study. Thank you in advance for you co-operation in this matter.

Yours faithfully

Paul Jones
Department of Enterprise and Economic Development
Business School

Appendix B: The Quantitative Survey Instrument

Part 1 – The Cardiff Chamber of Commerce Survey Instrument

Electronic Commerce Survey

In 1999, Cardiff Chamber of Commerce undertook research into the uptake of electronic commerce amongst its members. This follow-up survey is an attempt to identify the position amongst the membership one-year on and how E-Commerce has developed within these organisations and new adopters of the technology. We would be grateful if you could spend a few minutes in answering the questions below to the Chamber.

Organisation Name/ Website	
Contact Name	
Website	
E-mail Address	

1a. Please choose from the descriptions below, the one that most aptly describes your business use of information technology (tick one box):

We **don't use** any information technology in our organisation	
We have one personal computer running packages such as Microsoft Word	
We have more than one personal computer running software packages such as Microsoft Word	
We have a number of personal computers sharing a printer over a local area network	
We have a local area network of personal computers sharing applications on a server	
We have a local area network of personal computers sharing applications on a number of servers	
We have a number of local and wide area networks of computers in our business	

If the answer is ***don't use*** *any* please go to **section 7.**

b. What proportion of employees in your organisation use information technology on a daily basis? (tick one box):

Up to a quarter	
Up to a half	
Up to three quarters	
More than three quarters	
Don't know	

c. Please indicate the number of people in your organisation with **full-time** responsibility for purchasing, installing and/or maintaining information technology (tick one box):

None	
1	
Between 2 and 10	
More than 10	

d. Please identify the job title of the individual responsible for IT within your organisation

IT/MIS Computer Services Manager/Director	
Network Manager/Director	
Operations Manager/Director	
Managing Director	
Financial Manager	
Director	
Partner	
President	
Chief Executive	
Owner	
Other (please specify)	

2. Electronic Commerce and your Current Business

a. Does your organisation use any of the following types of Information Technology? (tick those that apply):

Electronic Data Interchange (EDI)	
Video-conferencing	
Electronic mail	
Intranet	
Extranet	
Groupware	
None of the above	

b. Does your organisation have access to the Internet? (tick one box):

Yes	
No	
Don't know	

If the answer is *no* or *don't know* please go to **Section 4.**

c. How does your organisation currently connect to the Internet? (tick one box):

Via a modem and telephone line	
Via a modem and ISDN line	
Via cable modem and network	
Via the company network	
Don't Know	
Other (Please specify)	

d. What does your organisation use the Internet for? (tick all that are appropriate):

Electronic mail	
Finding information	
Advertising/marketing	
Entertainment	
Purchasing	
Sales	
Don't Know	
Other Purposes (Please Specify)	

e. Does your organisation currently have a web (WWW) site and what do you use it for? (tick those that apply):

Do not have a website	
Advertising/marketing to customers	
Distributing information to company employees	
Distributing information to suppliers	
Online sales	
Don't Know	
Have a website used for other things (please specify)	

If **Do Not have a website** go to **Section 3.**

f. What body developed your web (WWW) site (tick those that apply):

In house	
Specialist web design organisation	
European E-Commerce project (Please specify)	
Other (please specify)	

g What level of **income** have you generated from your Internet site during the last 12 months (tick one box):

£0	
£1-99	
£100-249	
£250-499	
£500-749	
>750	
Don't Know	

h. Approximately what percentage of your organisations trade/business if any is undertaken through the medium of E-Commerce:

	Normal Business	E-Commerce Trade/Business
Within Wales		
Rest of United Kingdom		
European Community		
Globally		

3. Drivers for Adopting Electronic Commerce

a. What reasons have led your organisation to consider electronic commerce? (tick all that are appropriate):

Communications cost savings	
Customers demanding electronic connection to organisation services	
Suppliers demanding electronic communication with your organisation	
To create a new marketing media	
To gain access to new markets	
To gain an innovative image	
To gain competitive advantage	
To improve the communication of information	
To keep up with your competitors	
Your employees pushing for information technology to support their work	
Other (Please Specify)	

4. Disablers to Adopting Electronic Commerce

a. What factors have limited or constrained your organisation's adoption of electronic commerce? (tick all that are appropriate):

Insufficient time to develop & maintain site.	
Lack of IT/WWW specialist skills	
Insufficient financial resources	
Lack of information, advice and support	
Lack of understanding, confidence & awareness	
Organisation structure & culture	
Fear of domination by large business	
Low use by customers and suppliers	
Concerns over security	
Not relevant to my organisation	
Other (Please Specify)	

5. Benefits of Electronic Commerce

a. Which of the following proposed benefits of electronic commerce are currently relevant to your business and which do you believe will be relevant to your business over the next five years? (tick all that are appropriate):

Benefit	**Current Relevance**	**Future Relevance**
Reduced costs of communication with customers		
Reduced costs of communication with suppliers		
Quicker response time to market and shorten supply chain		
Improved access to information sources and information exchange		
Reduced internal administration costs and greater efficiency		
Increased revenue		
Increased/ improved supplier/customer links		
Increased and new access to national and global markets		
Develop business partnerships through strategic alliances and outsourcing		
New methods of advertising and marketing products and services		
Ability to create new forms of organisation		
Other (Please Specify)		

6. Problems with Electronic Commerce

a. Which of the following perceived problems with electronic commerce are currently relevant to your business, and which do you believe will still remain relevant to your business over the next five years? (tick all that are appropriate):

Problems	**Current Relevance**	**Future Relevance**
Lack of security associated with E-Commerce transactions		
Lack of technological standards		
Costs of telecommunications services		
Problems of bandwidth		
Problems of getting sufficient IT expertise		
Other (Please specify)		
No perceived problems		

7. Further Information

a. Would you like a copy of the results of the survey? (please tick one box):

Yes	
No	

b. Would you like to be sent further information on electronic commerce? (please tick one box):

Yes	
No	

Appendix B Part 2: E-business Questionnaire

E-Business Survey

This questionnaire has been designed to investigate the uptake of E-Business within SMEs in Wales as part of research on behalf of the University of Glamorgan. The contents of this form are confidential information. The identifying respondent will not be disclosed under any circumstances.

Organisation Name/ Website	
Contact Person	
Telephone/E-mail Address	

1.Your Organisation

a. Please indicate how many people are currently employed by your organisation (tick one box):

Sole-Proprietor	
1-9	
10-49	
50-249	

b. What is the main industry activity of your organisation (tick one box):

Agriculture/Forestry/Fishing	
Mining & Quarrying	
Construction	
Manufacturing	
Communications/Computing	
Wholesaler	
Retail/Repair	
Finance/Insurance/Real Estate/Legal	
Services/Transport	
Education	
Health/Medical	
Other	

c. Identify your main business markets for your 'normal' business market. Approximate using a **percentage**.

	Normal Business %
Within Wales	
Rest of United Kingdom	
European Community	
Globally	
Don't Know	

2a. Please choose from the descriptions below, the one that most aptly describes your business use of information technology (tick one box):

We **don't use** any information technology in our organisation	
We have one personal computer running packages such as Microsoft Word	
We have more than one personal computer running software packages such as Microsoft Word	
We have a number of personal computers sharing a printer over a local area network	
We have a local area network of personal computers sharing applications on a server	
We have a local area network of personal computers sharing applications on a number of servers	
We have a number of local and wide area networks of computers in our business	

If the answer is ***don't use*** *any* please go to **section 8**.

b. What proportion of employees in your organisation use information technology on a daily basis? (tick one box):

Up to a quarter	
Up to a half	
Up to three quarters	
More than three quarters	
Don't know	

c. Please indicate the number of people in your organisation with **full-time** responsibility for purchasing, installing and/or maintaining IT? (tick one box):

None	
1	
Between 2 and 10	
More than 10	

d. Please identify the job title of the individual responsible for IT (purchase, implementation and maintenance) within your organisation (tick one box):

IT/MIS Computer Services Manager/Director	
Network Manager/Director	
Operations Manager/Director	
Managing Director	
Financial Manager	
Director	
Partner	
President	
Chief Executive	
Owner	
Other (please specify)	

3. E-Business and your current business

a. Does your organisation use any of the following types of Information Technology? (tick those that apply):

Electronic Data Interchange (EDI)	
Video-conferencing	
Electronic mail	
Intranet	
Extranet	
Groupware	
None of the above	

b. Does your organisation have access to the Internet? (please tick one box):

Yes	
No	
Don't know	

If the answer is *no* or *don't know* please go to **section 5.**

c. How does your organisation currently connect to the Internet? (tick one box):

Via a modem and telephone line	
Via a modem and ISDN line	
Via cable modem and network	
Via the company network	
Don't Know	
Other (Please specify)	

d. What does your organisation use the Internet for? (Tick all that are appropriate):

Electronic mail	
Finding information	
Advertising/marketing	
Entertainment	
Purchasing	
Sales	
Don't Know	
Other Purposes (Please Specify)	

e. Does your organisation currently have a web (WWW) site and what do you use it for? (tick those that apply):

Do not have a website	
Advertising/marketing to customers	
Distributing information to company employees	
Generate Enquiries	
Distributing information to suppliers	
Online sales	
Don't know	
Have a website used for other things (please specify)	

If you **do not have a website** go to **Section 5.**

f. What body developed your web (WWW) site (tick those that apply):

In house	
Specialist web design organisation	
European E-Commerce project (Please specify)	
Other (please specify)	

g. How much did your site **cost** your organisation to develop (tick one box):

£0 -£100	
£101-£500	
£501-1000	
£1001-2000	
£2000-5000	
£5000+	
Don't Know	

h. What level of **income** have you generated from your Internet site during the last 12 months (tick one box):

£0	
£1-99	
£100-249	
£250-499	
£500-749	
£750-1000	
£1001–3000	
£3001- 5000	
£5001+	
Don't Know	

i. Identify your main business markets for your E-Commerce market. Approximate using a **percentage** (out of 100%) (tick for does not apply or don't know).

	E-Commerce Trade/Business %
Within Wales	
Rest of United Kingdom	
European Community	
Globally	
No E-Commerce trade	
Don't Know	

4. Drivers for adopting E-Business

a. What reasons have led your organisation to consider E-Business? (tick all that are appropriate):

Communications cost savings	
Customers demanding electronic connection to organisation services	
Suppliers demanding electronic communication with your organisation	
To create a new marketing media	
To gain access to new markets	
To gain an innovative image	
To gain competitive advantage	
To improve the communication of information	
To keep up with your competitors	
Your employees pushing for information technology to support their work	
Other (Please Specify)	

b. Has you organisation's adoption of E-Business resulted in any changes in your business practices?

c. Has E-Business been integrated within your business plan? (tick one box):

Yes	
No	
Don't Know	

5. Barriers to adopting E-Business

a. What factors have limited or constrained your organisation's adoption of E-Business? (tick all that are appropriate):

Insufficient time to develop and maintain site.	
Lack of IT/WWW specialist skills	
Insufficient financial resources	
Lack of information, advice and support	
Lack of understanding, confidence and awareness	
Organisation structure and culture	
Fear of domination by large business	
Low use by customers and suppliers	
Concerns over security	
Not relevant to my organisation	
Other (Please Specify)	

6. Benefits of E-Business

a. Which of the following proposed benefits of E-Business are currently relevant to your business and which do you believe will be relevant to your business over the next five years? (tick all that are appropriate):

Benefit	**Current Relevance**	**Future Relevance**
Reduced costs of communication with customers		
Reduced costs of communication with suppliers		
Quicker response time to market and shorten supply chain		
Improved access to information sources and information exchange		
Reduced internal administration costs and greater efficiency		
Increased revenue		
Increased/ improved supplier/customer links		
Increased and new access to national and global markets		
Develop business partnerships through strategic alliances and outsourcing		
New methods of advertising and marketing products and services		
Ability to create new forms of organisation		
Other (Please Specify)		

7. Problems with E-Business

a. Which of the following perceived problems with E-Business are currently relevant to your business, and which do you believe will still remain relevant to your business over the next five years? (tick all that are appropriate):

Problems	**Current Relevance**	**Future Relevance**
Lack of security associated with E-Commerce transactions		
Lack of technological standards		
Costs of telecommunications services		
Problems of bandwidth		
Problems of getting sufficient IT expertise		
Other (Please specify)		
No perceived problems		

8. Further Information

a. Would you like a copy of the results of the survey? (please tick one box):

Yes		Could I have your E-mail address please	
No			

b. Would you like to be sent further information on E-Business? (please tick one box):

Yes	
No	

Please return the completed questionnaire in the pre-paid envelope provided. Many Thanks. If you have any queries regarding the completion of the questionnaire please contact Mr Paul Jones on (01443) 654128 or via E-mail on wpjones1@glam.ac.uk.

Appendix C: Details of Quantitative Survey

Batch	Area	Total Return	Return Rate
1	Llanelli	21/39	Personal interview 10 enterprises visited /10 questionnaires completed. Postal delivery 14 questionnaires dispatched/ 3 questionnaires returned. Telephone 15 calls/ 8 questionnaires completed.
2	Swansea	22/101	Postal 101 questionnaires dispatched. 22 questionnaires completed. 18 Letters returned (OB). 3 (2OB) questionnaires returned uncompleted.
3	Llanelli and Swansea	14/15	Personal Interview 15 enterprises visited / 14 questionnaires completed.
4	Personal Interviews in Morriston Postal in Carmarthen, Llandovery, Cardiff and Pontardawe	22/24	Personal Interview 20 enterprises visited/ 18 questionnaires completed. Postal 4 postal 4 returned completed.
5	Swansea and Powys	20/21	Personal Interview 18 enterprises visited/ 17 questionnaires completed. Postal 3 postal 3 returned completed.
6	Personal Interviews in Swansea and Crosshands Telephone in Pembrokeshire Postal in Carmarthenshire and Swansea	17/27	Personal Interview 3 enterprises visited/ 3 questionnaires completed. Telephone 20 calls/11 questionnaires completed. Postal 4 dispatched 3 returned completed.
7	Postal in Vale of Glamorgan	26/111	Postal 111 Questionnaires dispatched. 26 questionnaires completed. 8 Letters returned (OB). 1 questionnaire returned uncompleted NA.
8	Telephone in Pembrokeshire	15/39	Telephone 39 calls/15 completed questionnaires.
9	Personal Interview in Pontypridd	22/29	Personal Interview 23 enterprises visited. 18/17 questionnaires completed. 5 questionnaires left 2 returned completed. Postal 6 questionnaires dispatched 3 returned completed.
10	Telephone in Merthyr Tyfdil Postal in Caerphilly	16/40	Telephone 39 calls/15 questionnaires completed. Postal 1 postal 0 returned.

11	Postal in Merthyr Tydfil, Carmarthenshire Telephone in Cardiff	16/44	Postal 8 postal 2 returned completed. Telephone 36 calls/14 questionnaires completed.
12	Postal in Caerphilly	19/100	Postal 101 Questionnaires dispatched. 19 questionnaires completed. 19 Letters returned (OB).
13	Telephone in Caerphilly	15/42	Telephone 42 calls/15 questionnaires completed.
14	Telephone in Ceredigion Postal in Carmarthenshire	18/42	Telephone 38 calls/15 questionnaires completed. Personal Interview 2 enterprises visited 2 questionnaires completed. Postal 2 postal/ 1 returned.
15	Telephone in Neath and Port Talbot Postal in Neath Interview in Swansea	16/43	Telephone 40 calls/15 questionnaires completed. Postal 2 postal 0 questionnaires completed. Interview 1 interview 1 questionnaire completed.
16	Telephone in Neath and Port Talbot Postal in Neath and Port Talbot	17/50	Telephone 47 calls/15 questionnaires completed. Postal 3 postal 1 questionnaire completed. Personal Interview 1 interview 1 completed.
17	Postal in Cardiff	30/122	Postal 122 questionnaires dispatched. 30 questionnaires completed. 2 questionnaire returned blank. 26 letters returned (OB).
18	Telephone in Newport Postal in Carmarthenshire,	16/38	Telephone 36 calls/16 questionnaires completed. Postal 2 postal 0 returned.
19	Telephone in Torfaen and Blaenau Gwent Interview in Swansea	32/87	Telephone 86 calls /31 questionnaires completed. Personal Interview 1 interview 1 questionnaire completed.
20	Telephone in Cardiff Interview in Swansea	16/41	Telephone 40 calls/15 questionnaires completed. Personal Interview 1 interview 1 questionnaire completed.
21	Torfaen, Blaenau Gwent, Caerphilly and Newport	28/128	Postal 128 questionnaires dispatched. 28 questionnaires completed. 10 letters returned (OB).
22	Interviews in Swansea and Carmarthenshire Telephone in Torfaen, Blaenau Gwent, Caerphilly and Newport	18/44	Personal Interview 3 interviews 3 questionnaires completed. Telephone 41 calls/15 complete.
23	Merthyr Tydfil	11/28	Telephone 27 calls 10 questionnaires completed. Personal Interview 1 interview 1 questionnaire completed.

24	Bridgend	12/15	Personal Interview 15 enterprises visited . 12/15 questionnaires completed. 3 questionnaires left 0 returned postal.
25	Cardiff	1/1	Personal Interview 1 enterprises visited. 1 questionnaire completed.
26	Bridgend	16/150	Postal 150 questionnaires dispatched. 16 questionnaires completed. 6 letters returned (OB).
27	Swansea	1/1	Personal Interview 1 enterprises visited. 1 questionnaire completed.
28	Carmarthenshire	1/1	Personal Interview 1 enterprises visited. 1 questionnaire completed.

Appendix D: Synopsis of Case Studies

Case study A

Case study A was a bed and breakfast in operation since 1985 in the Gower, Swansea, and run by a husband and wife team with the assistance of their children. It originally set up as a restaurant, but this changed in 1995 to focus on the bed and breakfast operation. The business operates all year round, catering in the main to short stay customers. The typical customer is married, in their 50s and usually retired. The annual turnover of the business is under £50,000. The business competes on quality of service and standard of accommodation, it being more expensive than its direct competition in the locality. The business makes use of one PC and a website, which was used predominantly to market the enterprise.

Case Study B

Case Study B operated within the retail sector as a second-hand record shop for vinyl in operation since 1990 in Neath. The enterprise was solely run by the proprietor, although he did get occasional help from a part-time assistant. The business recently undertook a significant operational change when it changed from a traditional shop to an online operation. The rationale for this change was a drop in demand, due to increased worldwide competition from the Internet. This change in working practice meant that enterprise B became an online trader, with the only business premises being a warehouse facility on a retail park for physical storage of records. The enterprise trades in a number of markets, predominantly UK, with a growing worldwide commitment, the typical customers being middle-aged males. The turnover of the business was less than £50,000, although this had grown significantly since the change in business operation. The business used two high specifications PCs, which were connected through a LAN, and a self-designed website which underpins the business operation.

Case Study C

Case study C was a self-employed stuntman, entertainer and actor, operating within the service sector. The business has a turnover of less than £50,000 per annum. The proprietor started the business in 2001 and developed his IT/IS skills in order to develop and support his acting and stuntman career. He utilised one PC which supported a multi media website that actively marketed and promoted his career.

Case Study D

Enterprise D was involved in the manufacture and sale of Celtic-related goods including home ware and jewellery, operating within the manufacturing and retail sectors and had been in operation since 2002. The enterprise sold direct to business and to individual customers through mail order, the Internet and trade fairs. The turnover was currently less than £10,000 per annum. The current trading market was almost entirely within the UK. The business was formed after a loan from the Prince's Trust. The business has use of one PC with Internet access, which enabled them to develop their own website.

Case Study E

This enterprise was founded in 2003, operated within the manufacturing and retail sectors and produced and sold bespoke designed medals. IT/IS played a significant part in the systems supporting the business including marketing and communication with key stakeholders. Business turnover was less than £10,000 in the first year of trading. The business operated a couple of PCs, which were linked through a network to a number of peripheral devices. The business has recently re-launched its website.

Case Study F

Enterprise F was an antique business specialising in the sale of Welsh furniture, based in Carmarthenshire, operating within the retail sector. The turnover of the business was in excess of £250,000 annually. The trading market was predominantly within the UK, with the remainder of the sales within Europe and the USA. The typical customer was middle aged, relatively prosperous and looked for items of furniture to furnish a traditional property.

Case study G

Enterprise G was a long-term established business having been in operation since 1968 and had been run by the current owners for 23 years. The enterprise was a large-scale producer and supplier of free range eggs, operating within the agricultural sector. The turnover of the business was in excess of £200,000 annually. The business had seen a significant growth since 2003 with a change in production strategy from intensive production methods to free range. This had resulted in an annual growth rate of 20% since 2004. The business made use of a number of PCs for communication with key stakeholders, marketing and administration purposes.

Enterprise H

The case study profiled an agricultural food producer operating within the Carmarthenshire region, specialising in the production of lamb. The turnover of the business was in excess of £50,000 per annum. The lamb was sold both wholesale and direct to customers. The business had expanded in recent years, due to increased sales, and now employed two-part-timers who are employed to cut, pack and despatch the product. The business now has a strong reliance on IT/IS and its website plays a key role in marketing and generating revenue.

Enterprise I

This enterprise was an à la carte restaurant within the services sector and has been in operation since 2001. The business operates within the Swansea area and specialised in fish dishes. The restaurant was managed and run by a husband and wife team and utilised a number of part-time staff. Turnover of the business was in excess of £200,000 per annum. The business does not make extensive use of IT/IS although predominant functions include administration, communication and marketing.

Enterprise J

Enterprise J operated in RCT within the manufacturing and retail sector and was a completely family run business. The business manufactured and sold specialist pottery and was founded in 1965. The turnover last year was in the region of £150,000, with the majority of sales generated through the traditional store within Wales. Sales had grown steadily in recent years, with the online market growing in significance. The business made extensive use of IT/IS for administration, communication, generating revenue and marketing purposes.

Appendix E: Case Study Research Instrument

Note

Comments in blue identify a summary of the interviewees individual response to a question by the interviewer.

Comments in black identify Owner/Managers direct quotes.

Enterprise Demographic

Demographic description – employees, turnover, industrial sector, product and service.

The proprietor is a 58-year-old man with a Masters degree in Marketing. His life and business partner is a 56- year-old female with no formal Higher education. Their children help with the business and are 16 and 19 respectively. Enterprise A operates within the Service sector and is classified as a "Sole-Proprietor" type organisation. Enterprise A is a family run bed and breakfast located in Oxwich, Gower in Swansea. The enterprise is run by a husband and wife team, with some further assistance from their children on occasion. The business operates a year-round provision, catering in the main to the short stay market. The typical customer is from the UK (usually London, Midlands, north west) with an average age of 50, plus who is recently retired. In addition, 10% of the annual customer base is international typically, from Europe or the USA. The turnover of the business is less than £50,000 per annum.

The proprietor noted that the nature of the customer has changed in the last ten years. During the 1980s, a typical customer would stay for a week. With the increase of low cost flying, cheaper foreign holidays and warmer climates, the nature of the market has changed. Visitors typically stay for shorter periods of time, normally three days or less. Mr A identifies this market as the "short stay" market who typically travel on such trips several times a year.

The unique selling point of the business is the quality of service. The business is more expensive than local competition but achieves a good level of return trade, due to the quality of the customer service and better standard of accommodation.

Background history of enterprise – year of formation, development and growth.

Enterprise A began in 1985 as a restaurant and bed and breakfast. This status changed in 1995, when the business focused purely on the bed and breakfast operation. The rationale for this change was that the restaurant was operating at only a breakeven level, in comparison to the profitability of the bed and breakfast operation. The nature of the business operation since then has not changed. The capacity of the business has increased, with an extension to the original property in the mid 1990s. However, the business remains largely unchanged from its original concept, with the exception of the restaurant. The growth of the business has been restricted by the nature of the enterprise. The proprietor noted it is not possible to increase the size of the business, due to the size of the premises. The bed and breakfast doubled up as the residential property of the owners and, due to its listed status, they were unable to further extend the property. The property was basically run by Mr and Mrs A. Mrs A held most responsibility for the day-to-day running of the business as Mr A was in full-time employment until 2005. Now retired, they aim to change the nature of the business into a holiday rental from 2006. As a result, the business will be converted into two separate living areas. Mr and Mrs A intend to use the website as a key mechanism for marketing the new business.

Use of E-Business within the enterprise

Describe your enterprise use of IT including identification of all systems and their usage.

IT equipment within the business

The enterprise uses one Internet-ready personal computer (PC). There is a dedicated telephone line for Internet connection.

Usage of IT

The PC is used mainly to support the business administratively. A number of support systems are utilised in the form of business software, namely:-

Word Processing – This is used to produce standard and non-standard material for the business e.g. Letters to suppliers/customers etc.

Spreadsheet – this is used for a number of important purposes. Firstly, Mr A undertakes and maintains all the accounts. Secondly, records of business performance in terms of levels of occupancy are maintained on an annual basis. This enables the proprietor to assess the likely demand for accommodation at any

given point within the year and contrast this performance to earlier years. This form of business forecasting is useful in terms of identifying potential staffing and stock levels at any time of year.

Desktop publishing – This is an important tool, which has been used to develop a brochure for the guest house. The brochure provides background information into the guest house, including details of breakfast menus and tariff charges. This brochure would be sent out to potential/customers via E-mail and traditional post.

Website – This will be considered later within the questionnaire but was developed using a web design programme, by members of the proprietor's family.

Electronic mail – E-mail is used via a dedicated telephone line as a mechanism to contact and be contacted by customers/potential customers.

The Internet – the Internet is used to search for competitive business insurance quotes and identify prices of competitors.

Identify why these systems are deployed?

The above systems were deployed to increase the administrative efficiency of the business and reduce costs. More specifically, the business used word processing, accounting and desktop publishing to reduced administrative costs. For example, the DTP package enabled the production of a professional-looking brochure which can be utilised to promote the business. The website was seen as a mechanism to actively market the business at a low cost.

Describe the development of IT usage within your organisation.

There has been an incremental usage of IT systems and increased reliance on these systems for business practices. The PC has been replaced on a three-year cycle to ensure that it would cope with the latest software developments. The use of business software has increased to become part of everyday business practices. The use of the website and E-mail enables immediate communication with customers and has become a key marketing practice. The use of E-Business and E-Commerce has been restricted by the lack of broadband within the Oxwich area.

"That's quite difficult to say, it certainly was not a planned development, more of a natural integration as the technologies became more freely available and cheaper. Also, the widespread use of E-mail meant that it was another way of marketing the business."

Has the use of IT influenced your organisation's development?

Mr A recognised that the use of IT had provided increased efficiency within the enterprise and a method of reducing certain costs such as administration and marketing. As a result, it had allowed them to market with increased effectiveness at a low cost.

"Prior to the use of PCs we would have had to get our brochures professionally designed; this has a significant cost associated with it. There was also a time cost in writing letters as opposed to word processing them and using an accountant to do all the books was a significant business cost."

How important is IT use to your organisation?

Mr A viewed IT usage as significant in an administrative and marketing context.

"The website is an important marketing tool for us."
"We use the PCs for a variety of administrative jobs, including the design of brochures which are then posted out to customers, for doing the accounts and basic word processing jobs."

Do you consider your IT development within your planning process for your business?

Mr A identified that there was no formal planning process in existence within the business. IT usage was identified on an ongoing basis. Mr A noted: -

"We do not plan our IT usage. I am reasonably competent, with good ICT skills, so I appreciated what benefits ICT could provide. However, I freely admit that I do not consider ICT strategically. There are no doubt missed opportunities."

Do any barriers exist to you further developing your use of IT?

Mr A identified several factors that further impeded his ICT usage. These included: -

Cost – Having a low turnover, the high potential capital cost in investing in ICT in contrast to potentially minimal increase in profit due to the size of the business, was a deterrent to further investment.

"Not having online payment facilities has probably cost us a number of customers. However the extra cost of this facility probably equates to the extra income that we would have generated from it.".

Sufficient time was identified as a barrier:-

"Running a small business means that I had limited time to explore the opportunities that IT offered. As I was in full-time employment, this meant that I did not have a great deal of time to consider IT usage effectively.".

ICT infrastructure - The business premises was limited by the lack of broadband access.

"The lack of broadband can be frustrating. I think we have lost a few customers, because we cannot E-mail the guesthouse brochure because of the time it takes. We rely on postal mail and potential customers might have found an alternative in the meantime."

Skills – associated with cost there was a reluctance to spend limited enterprise resources on further IT training. Therefore, IT was exploited in line with existing skills.

"At the end of the day, we are an eight bedroom guesthouse. We have a maximum revenue that we can achieve based on full occupancy. Our existing advertising through the Swansea Bay guide and the website allows us to achieve this at peak times of the year. Further investment in IT would not achieve any significant benefit when put off against the cost of purchase."

What are your motivations for utilising IT within your Enterprise?

"To increase enterprise efficiency, to reduce costs, to market the business."

Do you have plans to further develop your IT usage?

"Possibly, we aim to change the nature of the business from guest house to rented self catering accommodation. The website would be a key mechanism to market the business. If broadband became available, I would potentially introduce it."

Use of the Internet and website

What impact does the Internet have on your enterprise?

"We use the Internet to search for some business information, e.g. to hunt for business insurance. We introduced our organisation website in 2001. It's very difficult to evaluate accurately its actual impact. The type of customer has not altered since its introduction. However, it does provide a rapid mechanism to inform the customer regarding the nature and availability of the guesthouse."

What do you use the Internet for within your enterprise?

The website is used to promote the business e.g. via the Internet.
The Internet is used to collect information e.g. insurance.
E-mail is used as a communication mechanism between the guesthouse and customers.

"We use the Internet for a number of things. Firstly, to search for information. Google is excellent as a search facility. We look for insurance quotes for the business,. We also use it to check out competitor prices on occasion. We use E-mail to communicate quickly with customers."

Describe the development of your organisation website over the last three years?

No regular maintenance and update schedule for the website was identified.

"Very little, to be honest. I developed the website alongside my son. Since its inception, we have changed the site very little, except for the updating of some pictures and prices. It was maintained by myself and other members of the family."

What inspired/influenced you to create an organisation website?

Multiple factors inspired the website.

"It was inspired by a number of factors, I suppose, including the media, fellow business people and self-determination. The dotcom boom was very much in the media in 2000 and I decided it would be a worthwhile venture for the business. Also, I suppose I was aware that other similar businesses were considering setting up sites. It was self-inspired as well I suppose. We/I took the decision in 2001 as a business to develop the website to enhance the marketing of the business site. The Welsh tourist board were offering grants to invest in ICT. However, the terms were not attractive so we did not take the offer up. Other guesthouses in the area were developing a website so we decided to make the investment."

Who actually developed your website?

Mr A identified that the website had been developed in house. The reasons for this were that the family possessed the necessary skills.

"Members of the immediate family. My son is very good with Microsoft Publisher, and my wife (the proprietor's business and life partner). I also have a limited degree of expertise."

Describe the purpose and uses for your organisation website.

1. To market the business internationally.

"As approximately 10% of our market is overseas, the website is a great tool to market ourselves in an international market. The website is an effective method of achieving this aim."

2. To act as a portal for E-mail communication.

"E-mail is a great method of communicating with customers. We pull in a lot of E-mail enquiries regarding the guesthouse, although I reckon only 20% of this turns into actual business."

3. To inform potential customers.

"The website could be used to update customers regarding any special offers and promotions that we might be offering. For example, it might be useful around graduation time to promote the fact that we cater for family groups specifically for this purpose."

How is the website maintained?

Mr A identified no regular maintenance strategy for the website.

"It's not very well maintained, to be honest. Some of the current prices are out of date, for instance. We need to update it. I usually take that responsibility. I should be updating it on a monthly basis, especially the tariff chart. We have lost some trade because of the difference between our actual prices and the web prices."

Did any individuals or bodies influence your decision to introduce a website?

There was no direct influence on the creation of the resultant site. However there was previous contact from a body.

"The Welsh tourist board tried to encourage us to invest in a website. Apart from them, no."

Do you consider the role of your website within your business plan?

The proprietor identified no formal planning strategy or the business.

"No, to be honest, it was all done informally with no planning strategies."

What impact has your website had on your organisation?

The proprietor identified a raised marketing profile plus an improved communication mechanism (E-mail).

"Quite difficult to judge, because we do not track our customers and identify where they have come from. I would suspect that it has provided a quick and cheap method of informing our customers regarding our prices and the nature of the guesthouse and allows them to contact us quickly via E-mail."

Has your organisation website changed your customer base?

No difference was noted in the customer base.

"No, I don't think so. We seem to be taking the same type of customer as before. However, I would argue that the site has made us more competitive than organisations without such a facility."

Has the website changed your business practices in any way?

Administrative and marketing function improvements were identified.

"It's changed the way we do some of our administrative procedures. We take a number of queries from E-mail which we respond to within 24 hours. However, because we only have a 56k modem, it is very long to send our brochure electronically, so we send this out via postal mail. I suppose you could argue that it has allowed us to market ourselves on an international platform, something that we did not do previously. Whilst this is obviously beneficial to the business, we only get 10% of out trade from the overseas market."

Do any barriers exist to you further developing your use of your website?

ICT infrastructure was an issue, along with cost.

"As mentioned previously, the ICT infrastructure has restricted our ability to exploit all the advantages of the Internet as a cheap communication medium. Cost would be a significant factor. We have not introduced an online payment system as a result of this and this has cost us a couple of customers."

"Another thing I consider is an issue, is the size of the business. We are a small guesthouse and the investment in ICT will not result in any bottom line profit because we have a ceiling on the profit we can realistically achieve. We have no intention of moving to a different business premise so growth is not a consideration."

What are your motivations for utilising a website within your enterprise?

To increase the enterprise productivity and improve communication.

"Obviously, I think communication is key, but the bottom line is increased profit."

Does your website have any impact on your customers and suppliers?

Impact on customers in terms of increased communication effectiveness.

"Very little. No impact on suppliers. In terms of customers, it has improved their communication links to us and given them greater access to information."

What are your future plans (e.g. within a three year timescale) for the website?

Key role to market the changed nature of business and to have increased functionality on the site.

"The website will play an important part in the future of the enterprise. We intend to reinvent ourselves as a holiday rental property. Thus, the website will be the key mechanism to market the property on an international basis. I would envisage, if the price comes down enabling broadband and online payment. Information regarding the property would be E-mailed directly to the potential customer."

Appendix E Part 2

Enterprise A was revisited 18 months after the initial interview. The business had remained as a bed and breakfast style business. The rationale for the second interview was to ask the Owner/Manager to consider the impact of E-Business upon their organisation and the level of development undertaken. Prior to this second visit, the website was assessed to evaluate the level of development undertaken. This analysis revealed minimal changes in the site content or design. Several of the graphical images had been updated probably within the last six months. However the text and pricing list included was unchanged and now out of date.

Your use of IT

"Little has changed I suppose. We still use the same computer, software and website. The website was updated a number of months ago to improve the quality of the pictures of the hotel. However, I have not updated the site with this season's price yet, it's something I need to do."

The usage of IT/IS within enterprise A has not changed significantly during the eighteen month window. Indeed, website maintenance has declined and become an infrequent low priority process. However, the proprietor admitted that he was unconcerned by this and the amount of E-mail enquiry had remained constant.

Development of IT

"I have invested in broadband. It has only just become available in the village. I invested in broadband because the Internet is an useful tool and I wanted to improve the quality of the connection as the ISP can be a little patchy at times. I did a fair amount of research to investigate the potential options. It's a competitive market and I decided to shop around to find the best deal. Apart from that I have maintained the status quo. I do not envisage any further changes at present."

When questioned regarding use and development of IT, it was apparent there had been fairly minimal changes. The Owner/Manager identified that they had invested in broadband because of its increased affordability and availability. However, there had been minimal development or ongoing maintenance of the website. Indeed the website contained out of date pricing information which might deter potential visitors. The Owner/Manager still considered that website an important marketing asset and admitted that not enough attention was paid towards it. The Owner/Manger identified that barriers to E-Business growth where still present and motivations for usage remained largely as before.

Appendix F: Barnes and Vidgen's (2002) WebQual 4 framework for the assessment of E-Commerce_Quality

Usability

1. I Find the site easy to learn to operate.
2. My interaction with the site is clear and understandable.
3. I find the site easy to navigate.
4. I find the site easy to use.
5. The site has an attractive appearance.
6. The design is appropriate to the type of site.
7. The site conveys a sense of competency.
8. The site creates a positive experience for me.

Information

9. Provides accurate information.
10. Provides believable information.
11. Provides timely information.
12. Provides relevant information.
13. Provides easy to understand information.
14. Provides information at the right level of detail.
15. Presents the information in an appropriate format.
16. Has a good reputation.

Service Interaction

17. It feels safe to complete transactions.
18. My personal information feels secure.
19. Creates a sense of personalisation.
20. Conveys a sense of community.
21. Makes it easy to communicate with the organisation.
22. I feel confident that goods/services will be delivered as promised.

For each question, I had to rank each website using a seven-point scale where the anchors are: 1 = "Strongly disagree" and 7 = "Strongly agree"

Appendix G: Website Effectiveness Comparison using Barnes and Vidgen's (2002) framework

Usability	A	B	C	D	E	F	G	H	I	J	Mean	SD Dev
I Find the site easy to learn to operate.	5	6	7	5	6	6	6	3	6	5	5.5	1.1
My interaction with the site is clear and understandable.	6	6	6	4	6	6	6	4	6	5	5.5	0.8
I find the site easy to navigate.	3	6	6	4	7	5	6	4	6	5	5.2	1.2
I find the site easy to use.	5	6	6	5	6	6	6	4	6	5	5.5	0.7
The site has an attractive appearance.	2	4	5	4	6	6	6	2	7	4	4.6	1.7
The design is appropriate to the type of site.	4	4	5	4	6	6	6	2	6	5	4.8	1.3
The site conveys a sense of competency.	3	4	6	4	7	6	6	2	7	5	5.0	1.7
The site creates a positive experience for me.	3	5	6	3	5	6	4	2	7	5	4.6	1.6
Total	31	41	47	33	49	47	46	23	51	39	40.7	9.1
Information												
Provides accurate information.	3	6	6	4	6	6	5	4	6	5	5.1	1.1
Provides believable information.	4	6	6	4	6	6	6	4	6	6	5.4	1.0
Provides timely information.	3	7	5	4	6	6	6	4	6	6	5.3	1.3
Provides relevant information.	4	7	6	5	6	6	6	4	6	6	5.6	1.0
Provides easy to understand information.	4	6	6	5	6	6	6	4	6	6	5.5	0.8
Provides information at the right level of detail.	4	6	6	5	5	6	5	3	6	6	5.2	1.0
Presents the information in an appropriate format.	4	5	6	5	5	6	6	4	6	6	5.3	0.8
Has a good reputation.	3	5	4	3	5	6	6	3	5	7	4.7	1.4
Total	29	48	45	35	45	48	46	30	47	48	42.1	7.7
Service Interaction												
It feels safe to complete transactions.	n/a	6	n/a	5	6	n/a	n/a	3	n/a	6	5.2	1.3
My personal information feels secure.	3	5	n/a	4	5	n/a	n/a	2	n/a	6	4.2	1.5
Creates a sense of personalisation.	1	4	1	1	7	1	1	1	1	1	1.9	2.0
Conveys a sense of community.	1	3	1	2	1	1	1	1	2	2	1.5	0.7
Makes it easy to communicate with the organisation.	4	6	5	3	5	5	5	4	6	6	4.9	1.0
I feel confident that goods/services will be delivered as promised.	4	5	n/a	4	5	6	n/a	2	n/a	6	4.6	1.4
Total	13	29	7	19	29	13	7	13	9	27	16.6	8.8
Overall Score	73	118	99	87	123	108	99	66	107	114	99.4	

Appendix H: Chi-square tests

Table 1: Chi-square test -association between enterprise size classification and Internet access

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	22.570(a)	3	.000	.000		
Likelihood Ratio	25.733	3	.000	.000		
Fisher's Exact Test	23.795			.000		
Linear-by-Linear Association	22.090(b)	1	.000	.000	.000	.000
N of Valid Cases	362					

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.14.
b. The standardized statistic is -4.700.

Table 2: Chi-square test -association between E-mail usage and SME size classification

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.981(a)	3	.000
Likelihood Ratio	32.175	3	.000
Linear-by-Linear Association	22.291	1	.000
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.71.

Table 3: Chi-square test -association between SME classification and website ownership

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.439(a)	3	.000
Likelihood Ratio	28.443	3	.000
Linear-by-Linear Association	14.924	1	.000
N of Valid Cases	287		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.69.

Table 4: Chi-square test -association between SME classification SME size and generating sales

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.906(a)	3	.031
Likelihood Ratio	8.157	3	.043
Linear-by-Linear Association	8.099	1	.004
N of Valid Cases	289		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.76.

Table 5: Chi-square test -association between the SME size classification and customers demanding connection to electronic services

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.672(a)	3	.022
Likelihood Ratio	9.722	3	.021
Linear-by-Linear Association	8.086	1	.004
N of Valid Cases	156		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.06.

Table 6: Chi-square test -association between SME classification and the desire to improve the communication of information

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.014(a)	3	.018
Likelihood Ratio	10.287	3	.016
Linear-by-Linear Association	9.742	1	.002
N of Valid Cases	156		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.13.

Table 7: Chi-square test -association between the business inhibitor lack of information, advice and support and SME size classification

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.014(a)	3	.018
Likelihood Ratio	10.287	3	.016
Linear-by-Linear Association	9.742	1	.002
N of Valid Cases	156		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.13.

Table 8: Chi-square test -association between SME classification and achieving a future quicker response time to market and shortening the supply chain

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.345(a)	3	.039
Likelihood Ratio	8.314	3	.040
Linear-by-Linear Association	7.659	1	.006
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.93.

Table 9: Chi-square test -association between SME classification and the desire to currently benefit from reduced internal administration costs and increased efficiency

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.230(a)	3	.000
Likelihood Ratio	18.538	3	.000
Linear-by-Linear Association	14.805	1	.000
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.81.

Table 10: Chi-square test -association between SME classification and the desire for future benefit from reduced internal administration costs and increased efficiency

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.949(a)	3	.005
Likelihood Ratio	13.424	3	.004
Linear-by-Linear Association	9.474	1	.002
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.34.

Table 11: Chi-square test -association between SME classification and the current desire to increase revenue

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.393(a)	3	.001
Likelihood Ratio	17.419	3	.001
Linear-by-Linear Association	1.150	1	.284
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.99.

Table 12: Chi-square test -association between SME and the desire to benefit from strategic alliances and outsourcing in the future

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.676(a)	3	.014
Likelihood Ratio	9.397	3	.024
Linear-by-Linear Association	9.191	1	.002
N of Valid Cases	363		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.15

Appendix I: Frequency Analysis of Traditional Trading Markets of survey respondents

Main Industry Activity * Business Market Wales Cross-tabulation

	Grouped Frequency Analysis by Percentage											
Business Sector	**0**	**1-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**81-90**	**91-99**	**100**	Total
Agriculture/ Forestry/Fishing	8	1	1	0	1	0	0	0	0	0	0	0	**11**
Construction	38	5	7	0	0	0	0	0	0	0	0	0	**50**
Manufacturing	41	15	12	18	0	5	4	3	7	3	0	2	**110**
Communications/ Computing	8	3	1	1	1	1	0	0	0	1	0	1	**17**
Wholesaler	14	6	2	1	1	1	0	1	0	1	1	0	**28**
Retail/Repair	56	13	0	2	7	1	1	1	1	0	1	1	**84**
Finance/Insurance/ Real Estate/Legal	19	10	4	3	1	1	0	0	0	0	0	0	**38**
Services/Transport	55	25	7	6	8	5	4	5	4	5	1	0	**125**
Education	1	2	0	1	0	0	0	0	0	0	0	0	**4**
Health/Medical	3	0	0	0	0	0	0	0	0	0	0	0	**3**
Other	7	7	2	2	1	0	0	0	2	2	0	1	**24**
Total	**250**	**87**	**36**	**34**	**20**	**14**	**9**	**10**	**14**	**12**	**3**	**5**	**494**

Main Industry Activity * Business Market UK Cross-tabulation

Business Sector	**0**	**1-10**	**11-20**	**21-30**	**31-40**	**41-50**	**51-60**	**61-70**	**71-80**	**81-90**	**91-99**	**100**	Total
Agriculture/ Forestry/Fishing	8	1	1	0	1	0	0	0	0	0	0	0	**11**
Construction	38	5	7	0	0	0	0	0	0	0	0	0	**50**
Manufacturing	41	15	12	18	0	5	4	3	7	3	0	2	**110**
Communications/ Computing	8	3	1	1	1	1	0	0	0	1	0	1	**17**
Wholesaler	14	6	2	1	1	1	0	1	0	1	1	0	**28**
Retail/Repair	56	13	0	2	7	1	1	1	1	0	1	1	**84**
Finance/Insurance/ Real Estate/Legal	19	10	4	3	1	1	0	0	0	0	0	0	**38**
Services/Transport	55	25	7	6	8	5	4	5	4	5	1	0	**125**
Education	1	2	0	1	0	0	0	0	0	0	0	0	**4**
Health/Medical	3	0	0	0	0	0	0	0	0	0	0	0	**3**
Other	7	7	2	2	1	0	0	0	2	2	0	1	**24**
Total	**250**	**87**	**36**	**34**	**20**	**14**	**9**	**10**	**14**	**12**	**3**	**5**	**494**

Main Industry Activity * Business Market EC Cross-tabulation

Business Sector	0	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-99	100	Total
Agriculture/Forestry/ Fishing	9	1	0	1	0	0	0	0	0	0	0	0	**11**
Construction	50	0	0	0	0	0	0	0	0	0	0	0	**50**
Manufacturing	86	14	5	1	2	2	0	0	0	0	0	0	**110**
Communications/ Computing	13	2	1	0	0	0	0	0	0	0	0	1	**17**
Wholesaler	25	2	0	1	0	0	0	0	0	0	0	0	**28**
Retail /Repair	76	5	3	0	0	0	0	0	0	0	0	0	**84**
Finance/Insurance/ Real Estate/Legal	35	2	1	0	0	0	0	0	0	0	0	0	**38**
Services/Transport	102	18	4	0	0	1	0	0	0	0	0	0	**125**
Education	2	2	0	0	0	0	0	0	0	0	0	0	**4**
Health/Medical	3	0	0	0	0	0	0	0	0	0	0	0	**3**
Other	19	3	1	1	0	0	0	0	0	0	0	0	**24**
Total	**420**	**49**	**15**	**4**	**2**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**494**

Main Industry Activity * Business Market Global Cross tabulation

Business Sector	0	1-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-99	100	Total
Agriculture/Forestry/ Fishing	11	0	0	0	0	0	0	0	0	0	0	0	**11**
Construction	50	0	0	0	0	0	0	0	0	0	0	0	**50**
Manufacturing	96	10	0	0	1	2	0	0	0	0	0	0	**109**
Communications/ Computing	16	0	0	0	0	0	0	0	0	0	0	1	**17**
Wholesaler	27	1	0	0	0	0	0	0	0	0	0	0	**28**
Retail /Repair	83	1	0	0	0	0	0	0	0	0	0	0	**84**
Finance/Insurance/ Real Estate/Legal	35	3	0	0	0	0	0	0	0	0	0	0	**38**
Services/Transport	111	10	2	1	1	0	0	0	0	0	0	1	**126**
Education	2	2	0	0	0	0	0	0	0	0	0	0	**4**
Health/Medical	3	0	0	0	0	0	0	0	0	0	0	0	**3**
Other	21	2	0	0	1	0	0	0	0	0	0	0	**24**
Total	**455**	**29**	**2**	**1**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**2**	**494**

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